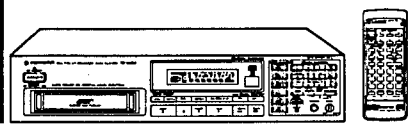
PIONEER®
The future of sound and vision.

Service Manual



ORDER NO.
ARP1956

MULTI-PLAY COMPACT DISC PLAYER

PD-M630

PD-M630 HAS FOLLOWING VERSIONS :

Type	Power requirement	Export destination
KU	AC120V only	U.S.A
KC	AC120V only	Canada
HEM	AC220V, 240V (switchable) *	European continent
HB	AC220V, 240V (switchable) *	United Kingdom
SD	AC110V, 120V-127V, 220V, 240V (switchable)	Kingdom of Saudi Arabia and General market
SD/G	AC110V, 120V-127V, 220V, 240V (switchable)	U.S.Military
HPW	AC220V, 240V (switchable) *	Australia

* Change the primary wiring of the power transformer board assembly.

- This manual is applicable to the KU, KC, HEM and HB types.
- As to the KC, HEM and HB types, refer to pages 39.
- As to the other types, refer to applicable service manuals.
- Ce manuel pour le service comprend les explications de réglage en français.
- Este manual de servicio trata del método ajuste escrito en español.
- As to the adjustments, refer to the multiple CD model (PD-M530) section of the ADJUSTMENT FOR CD PLAYERS, VOL.1 (ORDER No. ARP2000) except adjustment procedures which this service manual is mentioned.

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This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

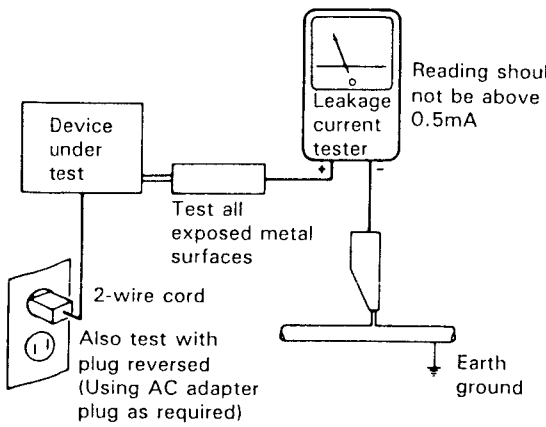
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

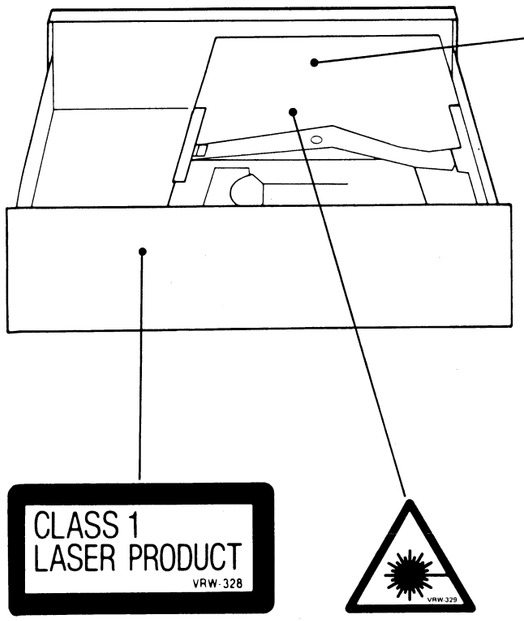
LABEL CHECK (MULTI MAGAZINE type)

HB type

CAUTION
INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM
PRW1018

HEM type

ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT!
UNSICHTBARE LASER-STRAHLUNG TRITT AUS, WENN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094



HEM and HB types

Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : high level, OFF : low level) status of the LPS3 (S601) and LPS4 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS3 and LPS4 are not ON (high level) (clamped state).
   Thus, interlock will no longer function if switches LPS3 (S601) and LPS4 (S602) are deliberately shorted.
   Also, in the test mode*, the interlock mechanism does not operate too.
   Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).
2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

* Refer to service manual ARP2000, FOR CD PLAYERS ADJUSTMENT VOL.1.

WARNING!

Lithium batteries. Danger of explosion. Replacement must be done by qualified personnel and only by following the instructions given in the service manual.

This warning is stated on the product or in the operating instructions. When replacing the lithium batteries, follow the note below.
Dispose of the used battery promptly. Keep away from children. Do not disassemble and do not dispose of in fire.
The battery used in this device may present a fire or chemical hazard if mistreated. Do not recharge, disassemble, heat above 100°C or incinerate. Replace only with the same Part Number. Use of another battery may present a risk of fire or explosion.

Note: The lithium battery installation position is shown in the exploded view and the P.C. board pattern.

ADVARSEL!

Lithiumbatteri — Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.

Denne advarsel or angivet på produktet eller i brugsvejledningen. Ved udskiftning af lithium batterierne følges nedenstående anveisning.
Batterierne må kun udskiftes med batterier af samme type og mærke.

VARNING

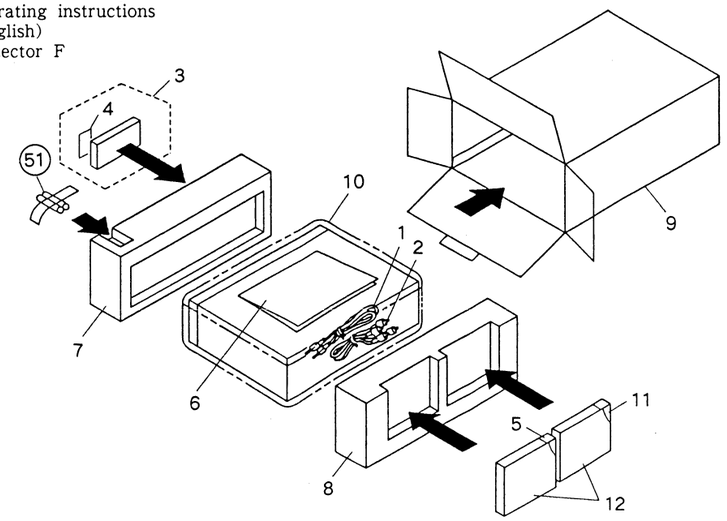
Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.

Denna varning finns på apparaten eller i bruksanvisningen. Följ nedanstående anvisningar vid byte av litiumbatterier.
Batterierna får endast bytas ut mot litiumbatterier av samma typ och fabrikat.

2. PACKING

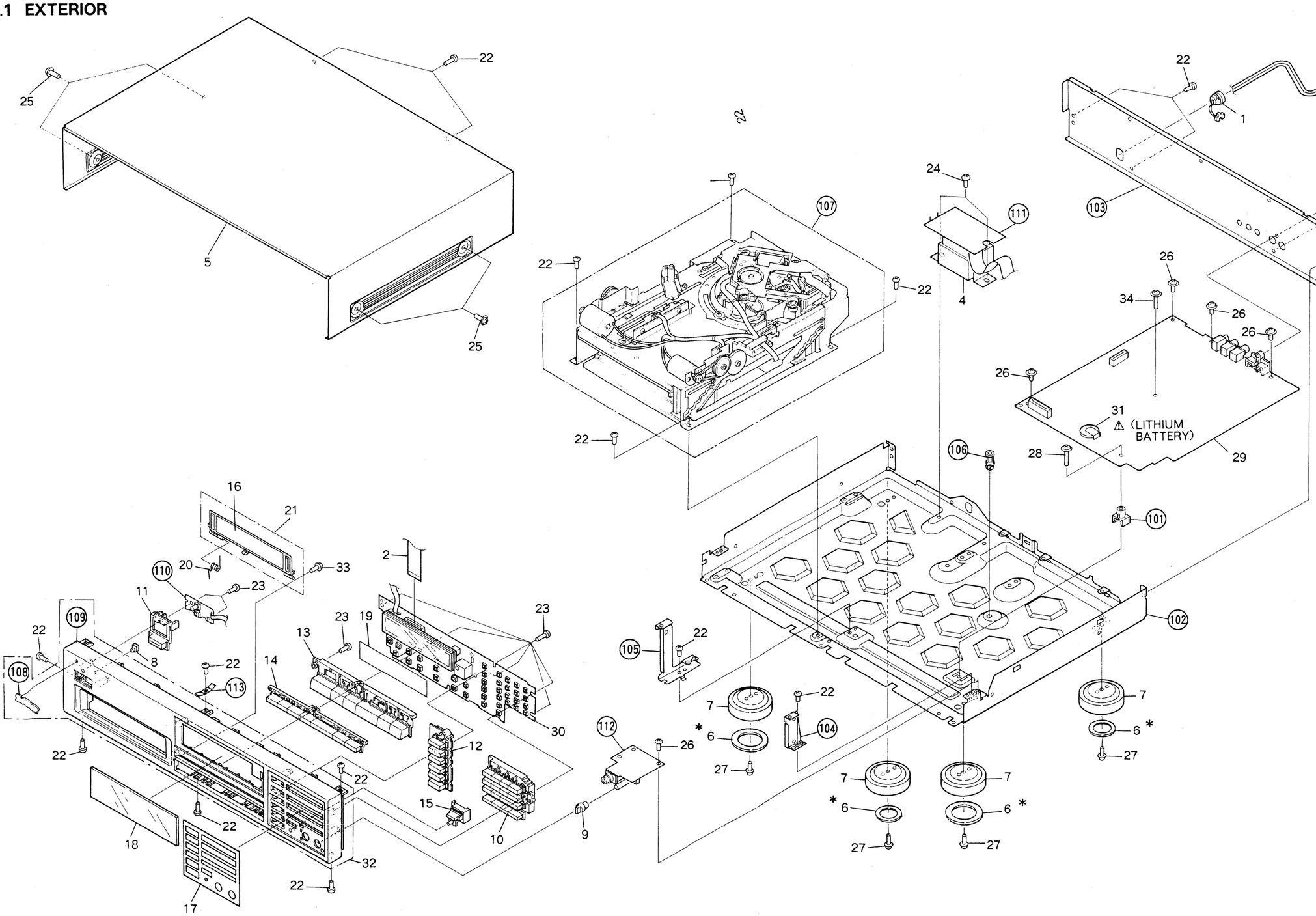
Parts List

Mark	No.	Part No.	Description
	1	PDE-319	Connection cord with mini plug
	2	PDE1001	Connection cord with pin plug
	3	PWW1049	Remote control unit
	4	PZN1001	Battery cover
	5	PXA1308	Magazine assembly
	6	PRB1123	Operating instructions (English)
	7	PHA1130	Protector F
	8	PHA1131	Protector R
	9	PHG1442	CD packing case
	10	Z23-007	Mirror mat sheet
	11	PXA1043	Single magazine assembly
	12	PYY1141	PP case
	51		Battery



3. EXPLODED VIEWS AND PARTS LIST

3.1 EXTERIOR



1. RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
Indicated in capacity (μF) / voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

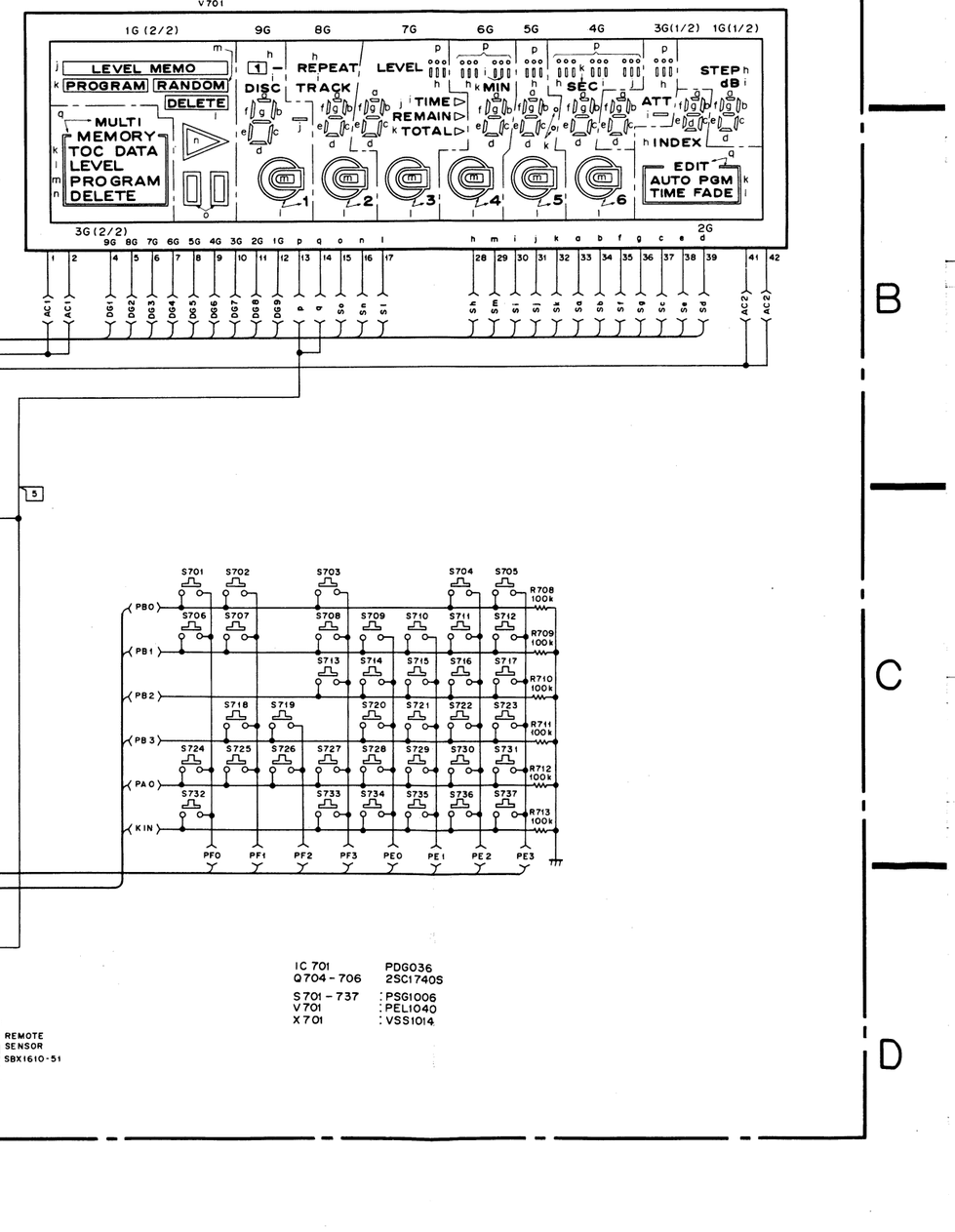
3. VOLTAGE, CURRENT :
▭ ; DC voltage (V) at play state.
⇦mA ; DC current at play state.
Value in ( ) is DC current at stop state.

4. OTHERS :
➡ ; Signal route.
Ø ; Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

5. SWITCHES : (The underlined indicates the switch position)
OUTSIDE OF P.C.BOARDS ASSEMBLY
INSIDE SWITCH
POWER SWITCH BOARD ASSEMBLY
S738 : POWER ON — OFF
SWITCH BOARD ASSEMBLY
S601 : LPS3] LOADING POSITION
S602 : LPS4]
S603 : MZS1] MAGAZINE
S604 : MZS4]
SELECT BOARD ASSEMBLY
S605 : DCHM] DISC POSITION
S606 : DCNT]
FUNCTION BOARD ASSEMBLY
S701 : TIME
S702 : STORE
S703 : DELETE
S704 : PGM
S705 : 1 DISC NUMBER
S706 : REPEAT
S707 : ERASE
S708 : +10]
S709 : 3]
S710 : 2] TRACK NUMBER
S711 : 1]
S712 : 2 DISC NUMBER
S713 : ≧20]
S714 : 6] TRACK NUMBER
S715 : 5]
S716 : 4]
S717 : 3 DISC NUMBER
S718 : TIME FADE
S719 : 4 DISC NUMBER
S720 : 9]
S721 : 8] TRACK NUMBER
S722 : 7]
S723 : AUTO PGM
S724 : EJECT (▲)
S725 : STOP (■)
S726 : PAUSE (❚❚)
S727 : 10 TRACK NUMBER
S728 : PLAY (▶)
S729 : |◀◀] TRACK SEARCH
S730 : ▶▶|]
S731 : 6 DISC NUMBER
S732 : ◜] AUTO FADER
S733 : ◝]
S734 : RANDOM PLAY
S735 : ◀◀] MANUAL SEARCH
S736 : ▶▶]
S737 : 5 DISC NUMBER

FUNCTION BOARD ASSEMBLY (PWZ1854 : KU, KC TYPES) (PWZ1853 : HEM, HB TYPES)



IC 701 PDG036
Q704 - 706 2SC1740S
S701 - 737 : PSG1006
V701 : PEL1040
X701 : VSS1014

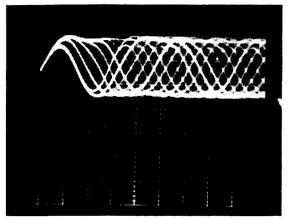
Wave Forms

Note: The encircled numbers denote measuring points in the schematic diagram.

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

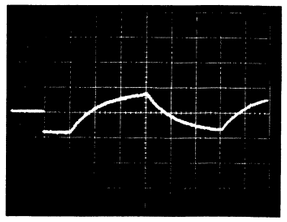
*3 POWER ON : Plug AC cord into AC wall socket.
*4 POWER OFF: Unplug AC cord from AC wall socket.

(2) TP1-Pin 1: PLAY MODE (RF)
500mV/div 500nsec/div



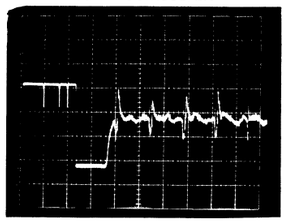
– GND

(5) Q201 Emitter: FOCUS-IN (*2) MODE (FODR)
1V/div 200msec/div



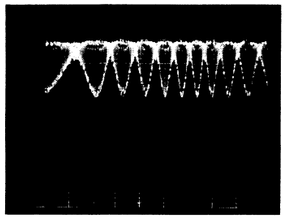
– GND

(7) IC201-Pin11 : TRACK SEARCH MODE (SPDR)
2V/div 50msec/div



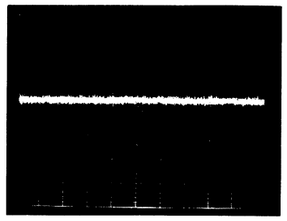
– GND

(2) TP1-Pin 1: TRACK SEARCH MODE (RF)
500mV/div 200μsec/div



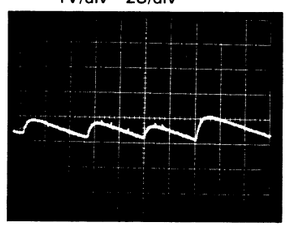
– GND

(5) Q201 Emitter: PLAY MODE (FODR)
1V/div 1msec/div



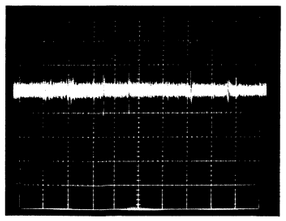
– GND

(8) IC201-Pin13 : PLAY MODE (CADR)
1V/div 2S/div



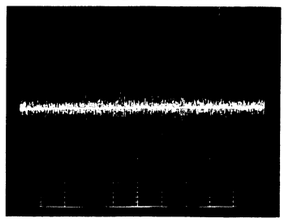
– GND

(3) TP1-Pin 6: PLAY MODE (FOER)
100mV/div 10msec/div



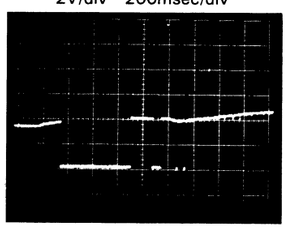
– GND

(6) Q203 Emitter: PLAY MODE (TRDR)
500mV/div 1msec/div



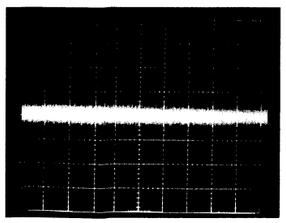
– GND

(8) IC201-Pin13 : TRACK SEARCH MODE (CADR)
2V/div 200msec/div



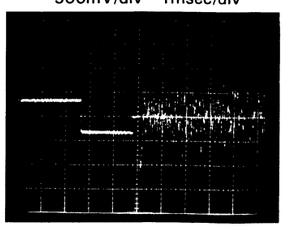
– GND

(4) TP1-Pin 2: PLAY MODE (TRER)
1V/div 10msec/div



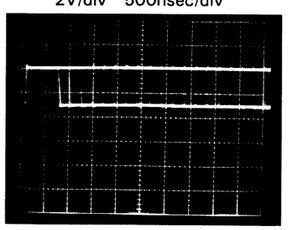
– GND

(6) Q203 Emitter: 50T-JUMP (*1) MODE (TRDR)
500mV/div 1msec/div



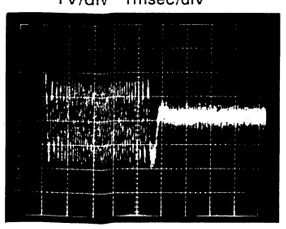
– GND

(9) IC151-Pin 38: PLAY MODE (EFM)
2V/div 500nsec/div



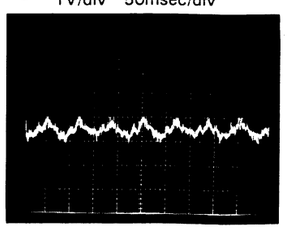
– GND

(4) TP1-Pin 2: 50T-JUMP (*1) MODE (TRER)
1V/div 1msec/div



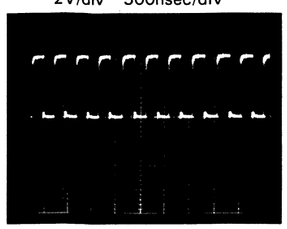
– GND

(7) IC201-Pin11 : PLAY MODE (SPDR)
1V/div 50msec/div



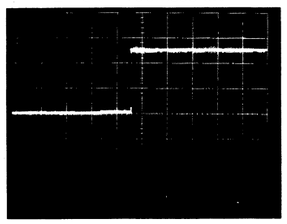
– GND

(16) IC301-Pin 35: PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div



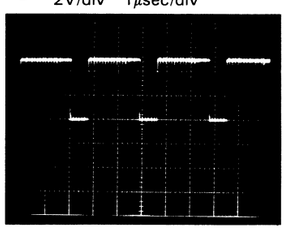
– GND

(22) IC60-Pin 5: POWER ON (*3) (RST)
2V/div 100msec/div



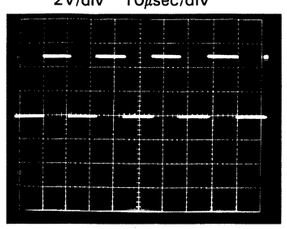
– GND

(26) IC401-Pin 13: PLAY MODE (1kHz) (DIG.FIL.WDCK)
2V/div 1μsec/div



– GND

(18) IC301-Pin 32: PLAY MODE (1kHz) (LRCK)
2V/div 10μsec/div

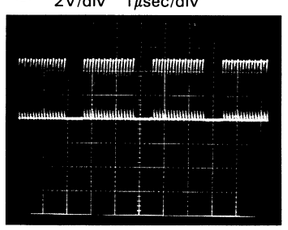


– GND

(22) IC60-Pin 5: POWER OFF (*4) (RST)
2V/div 100msec/div

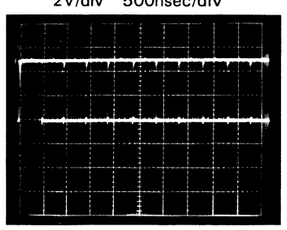
– GND

(27) IC401-Pin 15: PLAY MODE (1kHz) (DIG.FIL.BCLK)
2V/div 1μsec/div



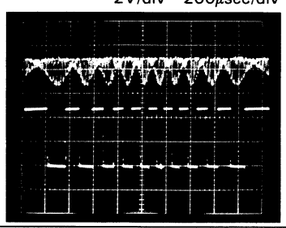
– GND

(19) IC301-Pin 34: PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div



– GND

(23) : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 35 (MIRR)
2V/div 200μsec/div

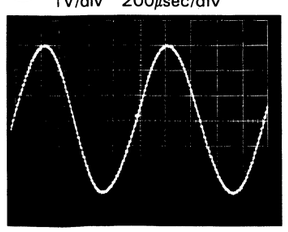


– GND

– GND

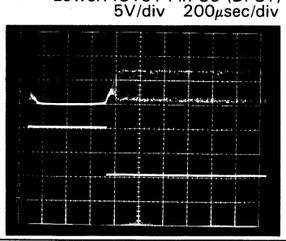
(28)

(20) IC402-Pin 9: PLAY MODE (1kHz) (D/A OUT)
1V/div 200μsec/div



– GND

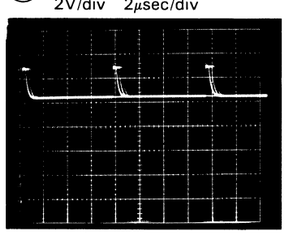
(24) : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 36 (DFCT)
5V/div 200μsec/div



– GND

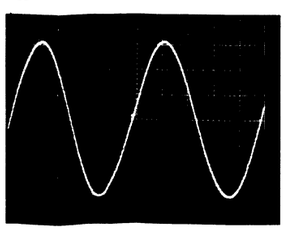
– GND

(33) IC301-Pin 4: PLAY MODE (MDP)
2V/div 2μsec/div



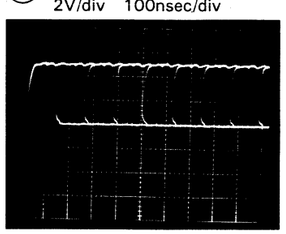
– GND

(21) PIN-OUTPUT: PLAY MODE (1kHz)
1V/div 200μsec/div



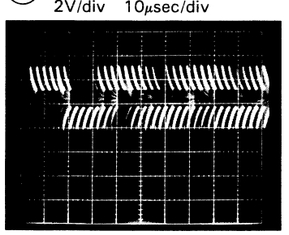
– GND

(25) IC401-Pin 12: PLAY MODE (1kHz) (DIG.FIL.DATA)
2V/div 100nsec/div



– GND

(53) IC301-Pin 20: PLAY MODE (PCO)
2V/div 10μsec/div



– GND

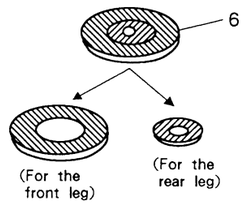
NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Part No.	Description
⚠	1	CM-22C	Strain relief
	2	PDD1058	Flexible cable
⚠	3	PDG1002	AC power cord
⚠	4	PTT1143	Power transformer (AC120V)
	5	PYY1131	Bonnet
	6	PNM1070	Stopper *
	7	VNK1095	Insulator
	8	AMR1160	LED lens
	9	PAC1370	Headphone knob
	10	PAC1440	Select button
	11	PAC1453	Power button
	12	PAC1454	Disc button
	13	PAC1455	Function button
	14	PAC1456	Mode button
	15	PAC1457	Memory button
	16	PAM1370	Door name plate
	17	PAM1371	Program name plate
	18	PAM1437	Display window
	19	PAM1373	Display screen
	20	PBH1022	Door spring
	21	PNW1532	Door
	22	BBZ30P080FCC	Screw
	23	BBZ30P120FZK	Screw
	24	BBZ40P060FMC	Screw
	25	FBT40P080FZK	Screw
	26	IBZ30P060FCC	Screw
	27	IBZ30P100FCC	Screw
	28	IBZ30P180FMC	Screw
◉	29	PWZ1843	Main board assembly
◉	30	PWZ1854	Function board assembly
⚠	31	PEM1003	Lithium battery (BT351)
	32	PEA1051	Function panel assembly
	33	IPZ30P060FMC	Screw
	34	IBZ30P150FMC	Screw

Mark	No.	Part No.	Description
	101		PCB mold
	102		Under base
	103		Rear base
	104		Angle
	105		Center angle
	106		PCB spacer
	107		Multi mechanism assembly
	108		Name plate
	109		Function panel
	110		Power switch board assembly
	111		Transformer board assembly
	112		Headphone board assembly
	113		Earth plate

* The stopper consist of the big ring part and the small ring part.
If you stick the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.

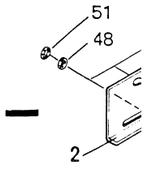


3.2 MECHANISM SECTION

Parts List of Mechanism Section

Mark	No.	Part No.	Description
	1	PEB1138	Belt
	2	PNB1219	Stair (L)
	3	PNB1220	Stair (R)
	4	PNW1644	Gear pulley
	5	PNW1645	Gear
	6	PNW1097	Gear
	7	PNW1640	Select SW base
	8	PNW1122	Gear
	9	PXM1011	Motor (LOADING, DISC SELECT)
	10	PBH-465	Eject spring
	11	PBH1014	Lock spring
	12	PBH1088	SM spring
	13	PBH1018	Stair spring
	14	PBK1009	Drive spring
	15	PBP-001	Steel ball ϕ 4
	16	PNW1099	Rack
	17	PNW1641	Operation plate
	18	PNW1639	Top guide
	19	PNW1253	Drive plate
	20	PNW1395	Lock lever
	21		• • • • •
	22	PBH1009	Earth spring
	23	PBA-125	Screw
	24	PBA1002	Screw
	25	PBH1016	Clamper spring (T)
	26	PBH1017	Clamper spring (B)
	27	PEB1014	Float rubber
	28	PED1001	Cushion (A)
	29	PED1002	Cushion (B)
	30	PXA1299	Rotary lever unit
	31	PNW1106	Clamper cam
	32	PNW1107	Clamper holder (T)
	33	PNW1108	Clamper holder (B)
	34	PNW1110	Pressure cam
	35	PNW1111	Upper tray
	36	PNW1448	Clamper
	37	PEA1028	D. C. motor assembly (SPINDLE) (with oil)
	38	PEB1132	Float rubber
	39	BPZ30P100FMC	Screw
	40	IBZ30P060FCC	Screw
	41	BBZ30P060FMC	Screw
	42	PCZ30P040FMC	Screw
	43	PMZ20P030FMC	Screw
	44	PMZ30P030FMC	Screw
	45	WA30F120M100	Washer
	46	WA32D060D050	Washer
	47	PLA1023	Roller
	48	WA31D054D050	Washer

Mark	No.	Part No.	Description
	49	WT12D032D025	Washer
	50	JFZ20P040FMC	Screw
	51	WT26D047D025	washer
	52	WT31D054D025	Washer
	53	BPZ20P080FZK	Screw
	54	PXM1013	D. C. motor (CARRIAGE)
	55	PNW1605	Half nut
	56	PBH1084	Drive spring
	57	PBK1057	Plate spring
	58	PEB1072	Belt
	59	PLA1003	Drive screw
	60	PLA1071	Guide bar
	61	PNW1634	Motor pulley
	62	PNW1066	Pulley
	63	PBZ30P080FMC	Screw
	64	PSH1003	Slide switch (INSIDE)
	65		• • • • •
	66	PEA1030	Pickup assembly
	67	PEA1035	Disc table assembly
	68	PNW1643	Motor pulley
	69	PNM1096	Cushion
	101		Motor base
	102		Switch board assembly
	103		Select board assembly
	104		Servo mechanism assembly
	105		Pressure spring
	106		Main chassis
	107		Gear angle (L)
	108		Gear angle (R)
	109		Synchronized lever
	110		SM select
	111		Eject lever
	112		Drive lever
	113		Bottom guide
	114		Actuater spring
	115		Binder
	116		Sub chassis
	117		Upper chassis
	118		Upper guide
	119		Actuater
	120		Earth lead unit
	121		SW angle
	122		Yoke M
	123		Mechanism base
	124		Cushion
	125		Cushion rubber 2.5
	126		Axis-sliding sheet
	127		Rubber tube
	128		Mechanism chassis
	129		Mechanism board assembly



r (CARRIAGE)
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assembly
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rd assembly
chanism assembly
spring
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e (R)
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spring
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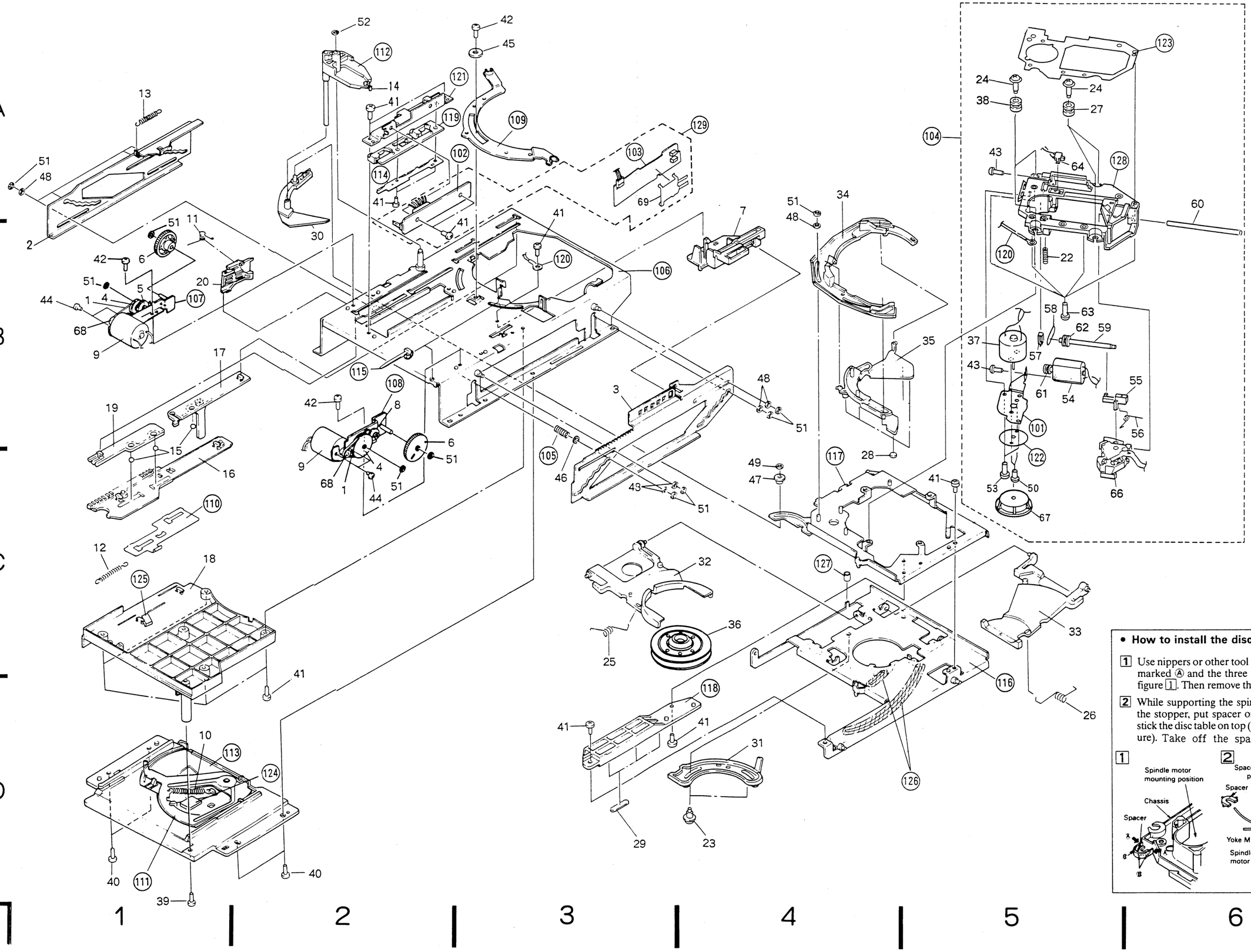
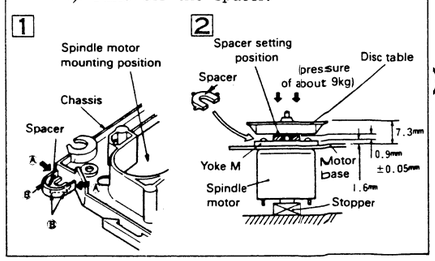
ı unit
ı base
ubber 2.5
ng sheet
ıbe
ı chassis
ı board assembly



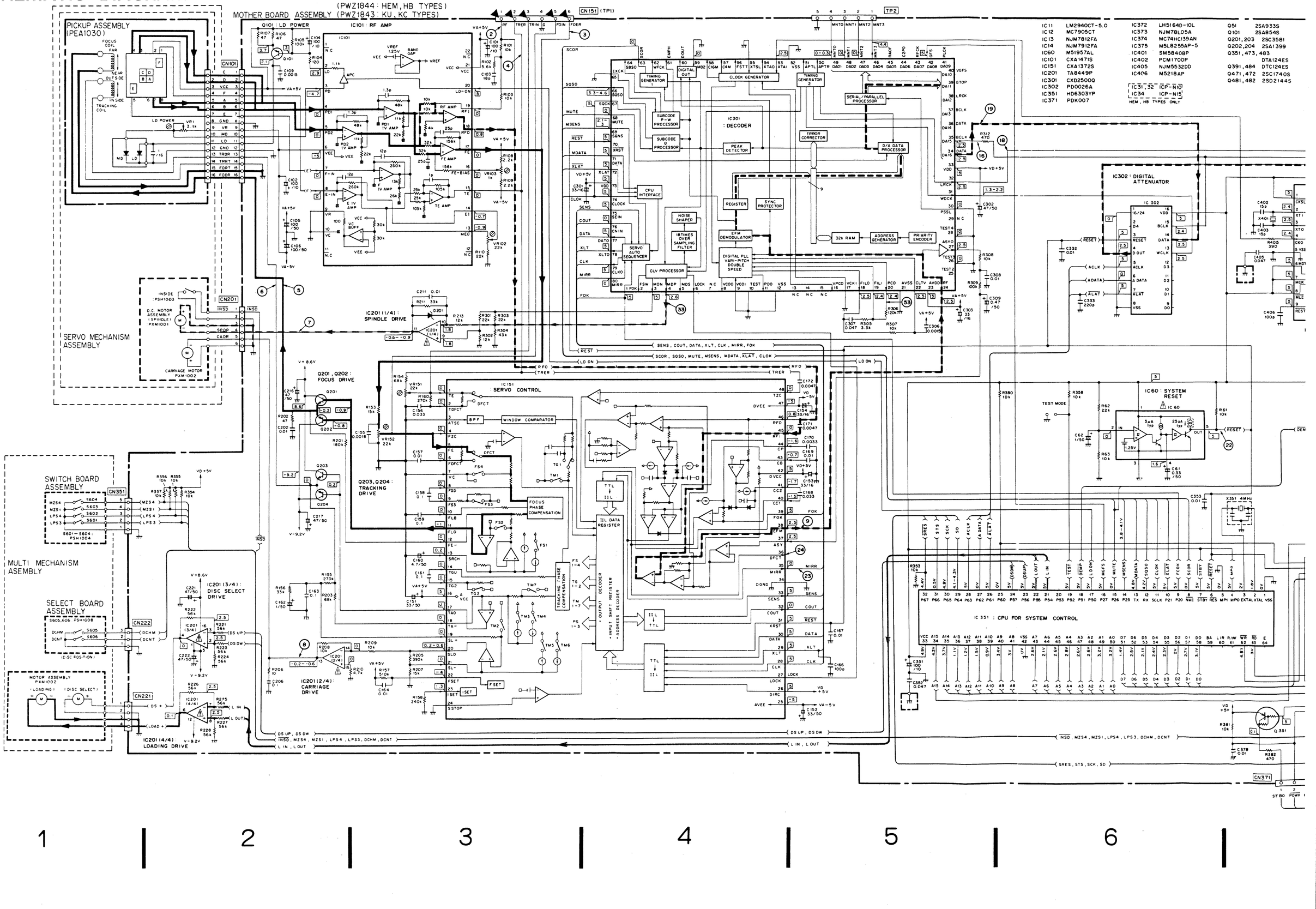
- **How to install the disc table**

1 Use nippers or other tool to cut the two sections marked Ⓐ and the three sections marked Ⓑ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of yoke M, and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



4. SCHEMATIC DIAGRAM



IC372	LH5164D-10L	Q51	2SA933S	D15	2W02-5008-L
IC373	NJM78L05A	Q101	2SA854S	D21-24,51,52	1ES2
IC374	MC74HC139AN	Q201,203	2SC3581	D53	MTZ22B
IC375	M5L8255AP-5	Q202,204	2SA1399	D54	MTZ7.5B
IC401	SM5840BP	Q351,473,483	DTA124ES	D201	MTZ6.2B
IC402	PCM1700P	Q391,484	DTC124ES	D371-373,395-397,	
IC405	NJM5532DD	Q471,472	2SC1740S	D471,472,481,482	ISS254
IC406	M5218AP	Q481,482	2SD2144S		

IC31,32 ICP-N10
IC34 ICP-N15
HEM, HB TYPES ONLY

D391-394 ISS254
KU, KC TYPES ONLY

VR102,151,152 :VRTB6VS223
VR103 :VRTB6VS102
VR411,412 :VRTB6VS104

X351 : FCR4.0MC
X401 : PSS1001

▶ : Measurement point
: Focus servo loop
: Signal route
: Tracking servo loop
: Carriage servo loop
: Disc select motor route
: Loading motor route
: Spindle motor route

IC405(1/2),(2/2): LOW PASS FILTER

Q481,Q482: MUTING

Q471,Q472: DE-EMPHASIS

IC402 : D/A CONVERTER

IC401 : DIGITAL FILTER

DIGITAL ATTENUATOR

IC302

HEADPHONE BOARD ASSEMBLY

IC406(1/2),(2/2): HEADPHONE AMP

IC60 : SYSTEM RESET

IC374 : ADDRESS DECODER

IC371 : ROM

IC372 : S-RAM

IC375 : EXPANDE I/O

Q351

Q473: SWITCH

Q483,Q484: MUTING

IC13,IC14: REGULATOR

IC373: REGULATOR

LITHIUM BATTERY

IC11,IC12: REGULATOR

Q51 : REGULATOR

Q391 : INVERTER BUFFER

TRANSFORMER BOARD ASSEMBLY

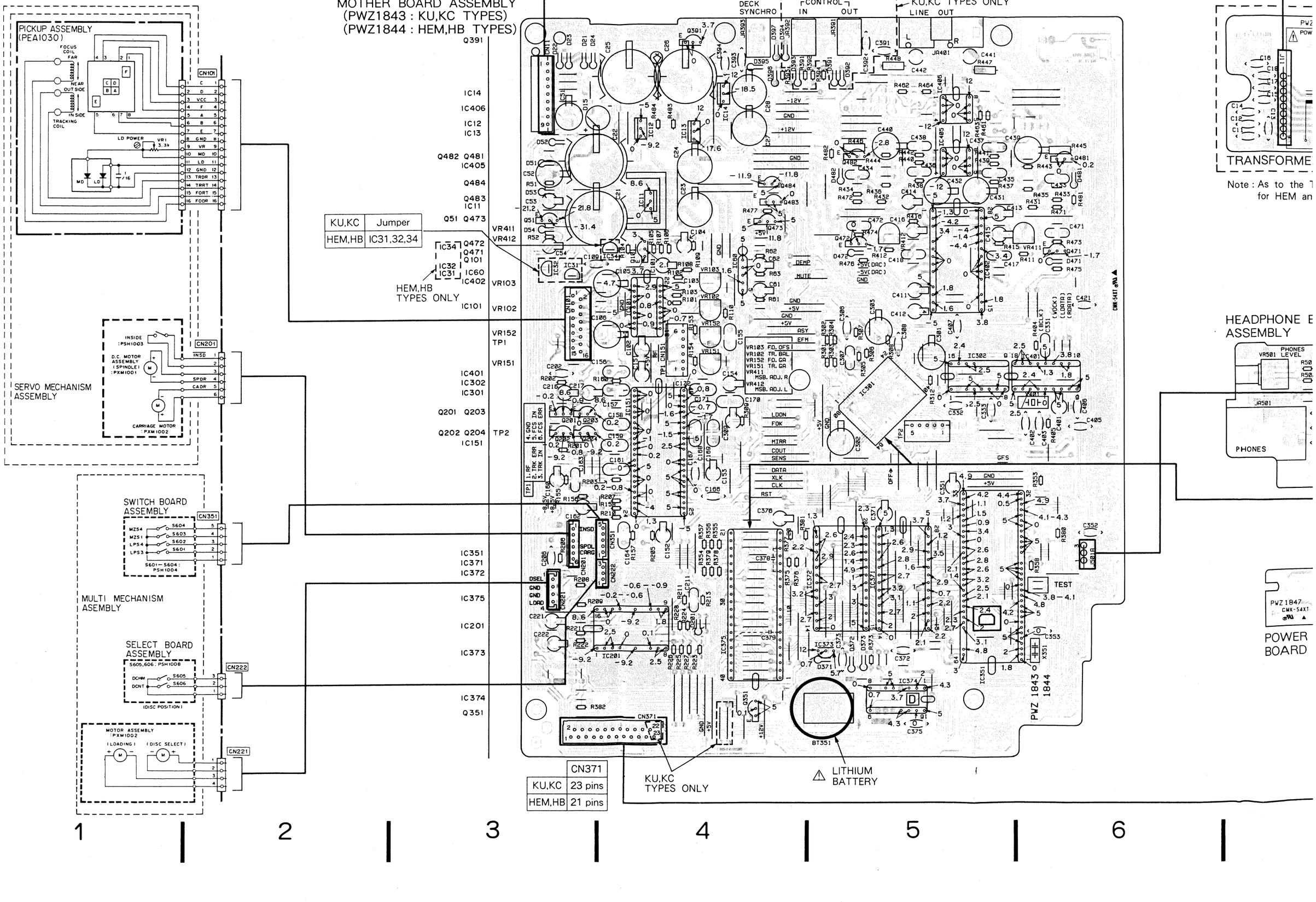
Note : As to the power supply section for HEM and HB types, refer to page 41.

	CN371
KU, KC	23PIN
HEM, HB	21PIN

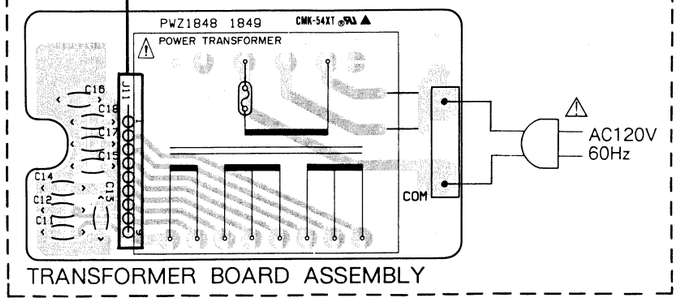
KU, KC TYPES ONLY

A
B
C
D
7
8
9
10
11
12

5. P.C.BOARDS CONNECTION DIAGRAM



KU,KC TYPES ONLY



TRANSFORMER BOARD ASSEMBLY

Note : As to the TRANSFORMER BOARD ASSEMBLY for HEM and HB types, refer to page 41.

IC301 (CXD2500Q)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N.C.
2	N.C.	42	5
3	5	43	N.C.
4	2.6	44	N.C.
5	N.C.	45	N.C.
6	5	46	4.4
7	N.C.	47	0
8	N.C.	48	0
9	0	49	0 – 0.3
10	0	50	N.C.
11	N.C.	51	N.C.
12	0	52	0
13	N.C.	53	2.5
14	N.C.	54	N.C.
15	N.C.	55	0
16	N.C.	56	N.C.
17	0	57	N.C.
18	2.5	58	N.C.
19	2.4	59	0
20	2.4	60	N.C.
21	0	61	N.C.
22	2.5	62	N.C.
23	5	63	0
24	2.5	64	N.C.
25	N.C.	65	0
26	0	66	3.3 – 4.6
27	2.5	67	5
28	0	68	0
29	N.C.	69	2.1 – 3
30	0	70	5
31	1.3 – 2.2	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	0
36	N.C.	76	5
37	N.C.	77	5
38	N.C.	78	5
39	N.C.	79	5
40	N.C.	80	0

IC375 (M5L8255AP-5)

Pin No.	Voltage	Pin No.	Voltage
1	0	21	0
2	0	22	5
3	0	23	5
4	0	24	5
5	0	25	5
6	0	26	5
7	0	27	2.4
8	3.2	28	2.5
9	0	29	2.1
10	5	30	2.4
11	N.C	31	2.
12	N.C	32	2.1
13	3.7	33	2.7
14	4.9	34	3.1
15	5	35	0
16	5	36	4.8
17	5	37	0
18	0	38	0
19	5	39	0
20	0	40	0

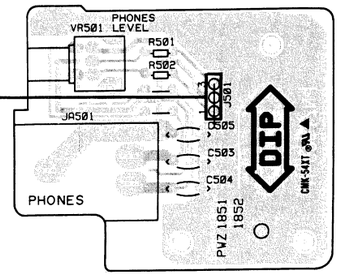
IC701 (PDG036)

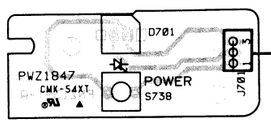
Pin No.	Voltage	Pin No.	Voltage
1	0.5	33	2.7
2	0	34	4.9
3	4.6	35	4.9
4	4.8	36	-3 – -5.4
5	4	37	-5 – -7.9
6	0	38	-5.1 – -7.5
7	4	39	– 14.7
8	0	40	– 2.4
9	0	41	– 5.7
10	0	42	– 14.1
11	0	43	– 8.9
12	0	44	– 3.4
13	0	45	– 14.4
14	0	46	– 2.4
15	0	47	2.4
16	4.9	48	– 17.9
17	4.9	49	– 18.1
18	4.9	50	– 18
19	4.9	51	– 18.1
20	4.9	52	– 18
21	4.9	53	– 18.1
22	4.9	54	– 17.9
23	4.9	55	– 18.1
24	0	56	– 18.1
25	0	57	– 21
26	0	58	0
27	0	59	0
28	0	60	1.9
29	N.C	61	2.2
30	N.C	62	4.4
31	4.9	63	4.9
32	0	64	5

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode			Styrol capacitor
		Zenner diode			Electrolytic capacitor (Non polarized)
		LED			Electrolytic capacitor (Noiseless)
		Varactor			Electrolytic capacitor (Polarized)
		Tact switch			Electrolytic capacitor (Polarized)
		Inductor			Power capacitor
		Coil			Semi-fixed resistor
		Transformer			Resistor array
		Filter			Resistor
					Resonator
					Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with O shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

HEADPHONE BOARD ASSEMBLY





POWER SWITCH BOARD ASSEMBLY

	CN701
KU,KC	23 pins
HEM,HB	21 pins

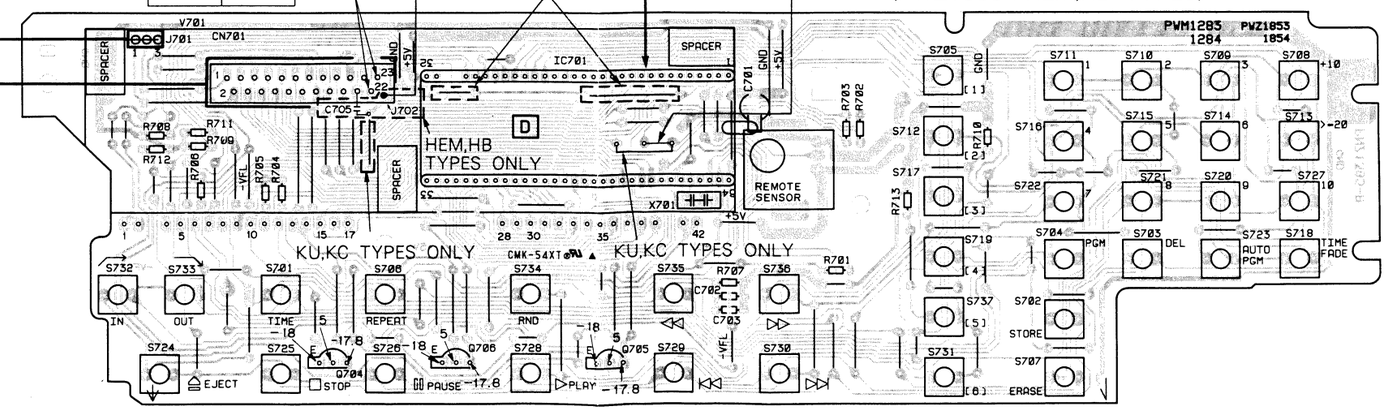
HEM,HB TYPES ONLY

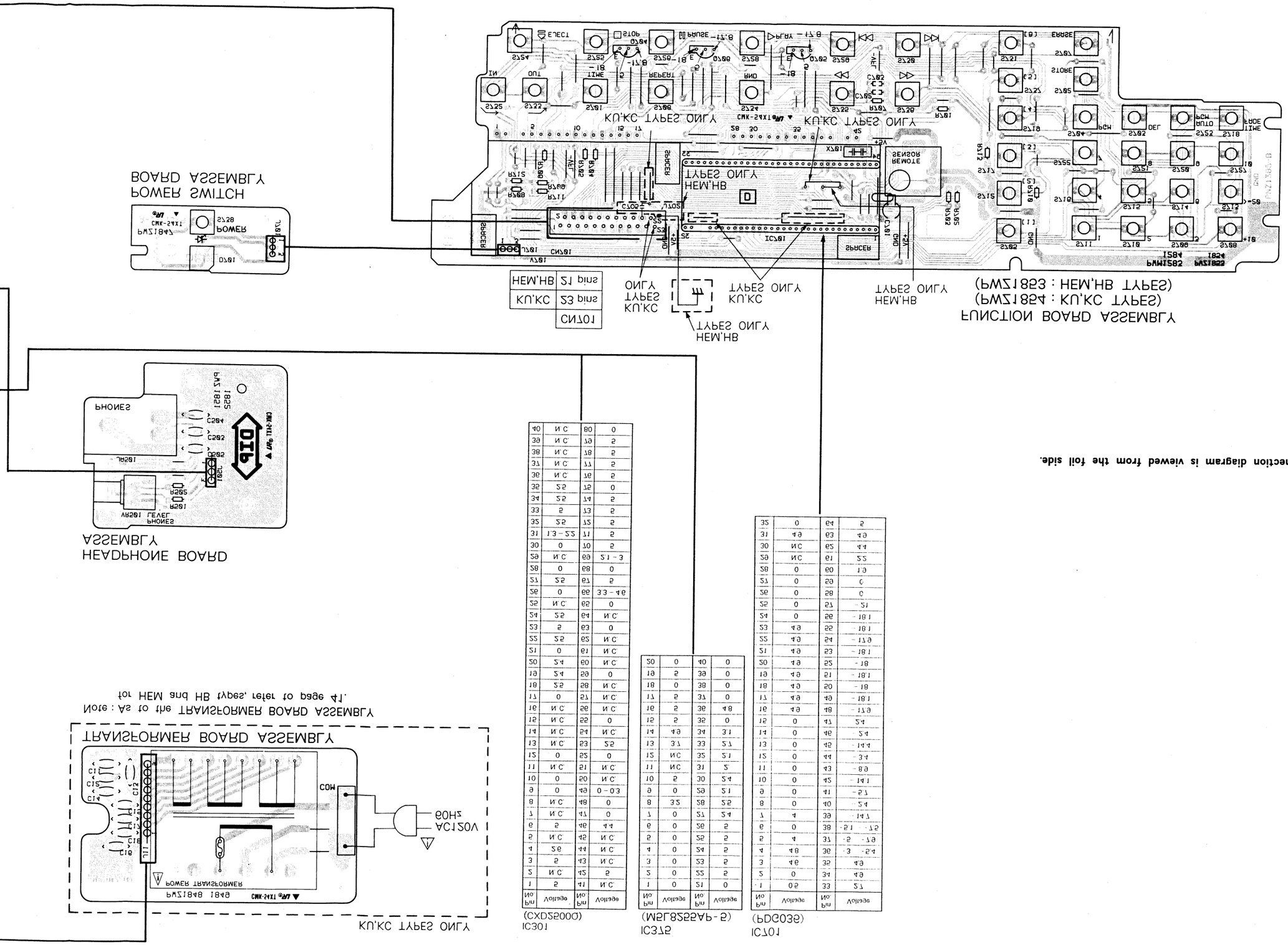
KU,KC TYPES ONLY

KU,KC TYPES ONLY

HEM,HB TYPES ONLY

FUNCTION BOARD ASSEMBLY
(PWZ1854 : KU,KC TYPES)
(PWZ1853 : HEM,HB TYPES)

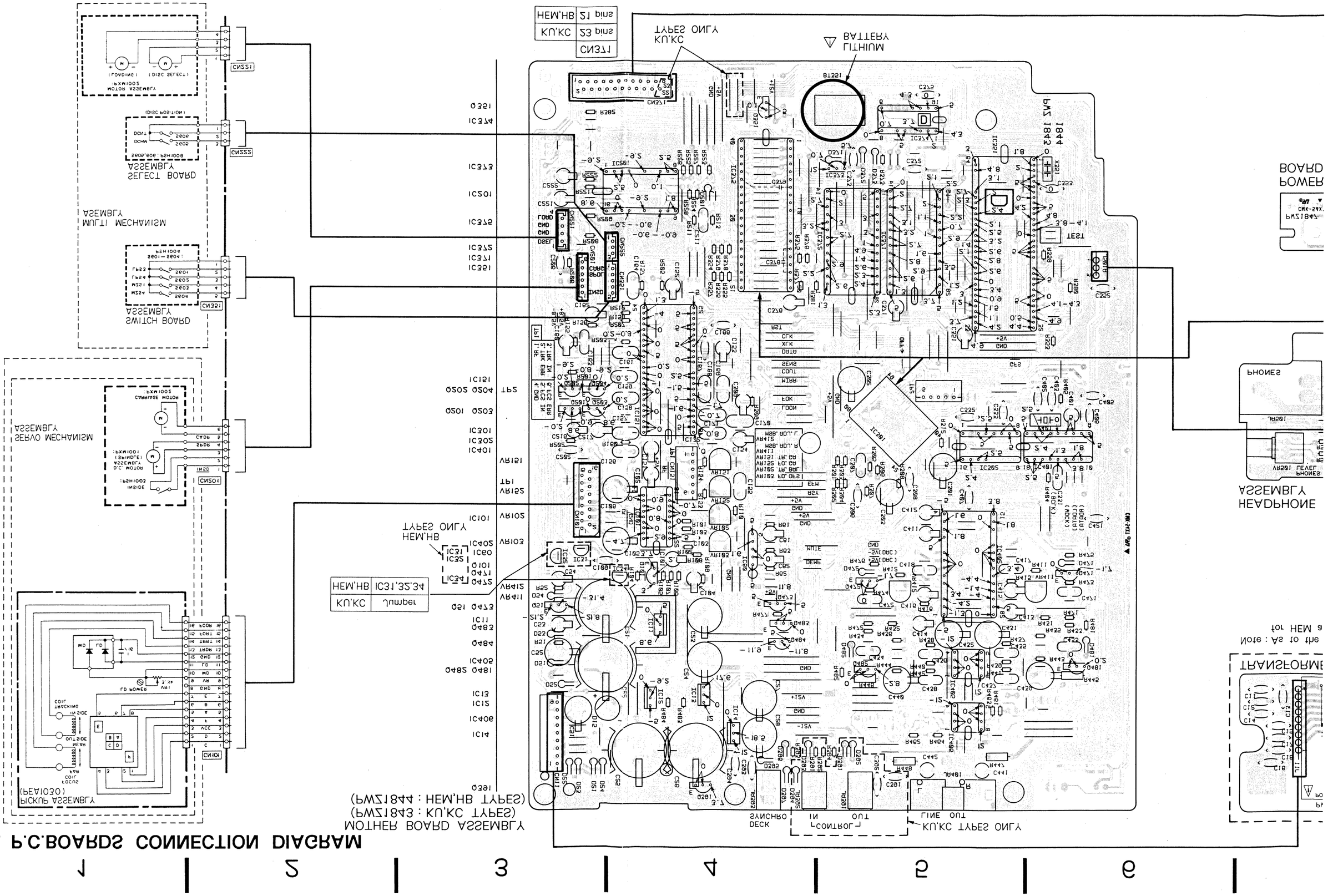




Note : As to the TRANSFORMER BOARD ASSEMBLY for HEM and HB types, refer to page 14.

This P.C.B. connection diagram is viewed from the foil side.

2. P.C.BOARDS CONNECTION DIAGRAM



6. P. C. B's PARTS LIST

NOTES :
- Parts without part number cannot be supplied.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	NO	Description	Part NO.
		◉Main Board Assembly (PWZ1843)	
		SEMICONDUCTORS	
	IC101	PRE AMP IC	CXA1471S
⚠	IC11	IC	LM2940CT-5.0
	IC12	IC	MC7905CT
	IC13		NJM7812FA
	IC14		NJM7912FA
	IC151	SERVO IC	CXA1372S
⚠	IC201	OP AMP, IC	TA8449P
	IC301	EFM DEMODULATION IC	CXD2500Q
	IC302		PD0026A
	IC351		HD6303YP
	IC371	MEMORY-IC	PDK007
	IC372		LH5164D-10L
	IC373		NJM78L05A
	IC374	LOGIC IC	MC74HC139AN
	IC375		M5L8255AP-5
	IC401	DIGITAL FILTER, IC	SM5840BP
	IC402	D/A CONVERTER, IC	PCM1700P
	IC405		NJM5532DD
	IC406	OP-AMP, IC	M5218AP
⚠	IC60	SYSTEM RESET IC	M51957AL
	Q101	TRANSISTOR	2SA854S
	Q201	TRANSISTOR	2SC3581
	Q202	TRANSISTOR	2SA1399
	Q203	TRANSISTOR	2SC3581
	Q204	TRANSISTOR	2SA1399
	Q351	TRANSISTOR	DTA124ES
	Q391	TRANSISTOR	DTC124ES
	Q471, 472	TRANSISTOR	2SC1740S
	Q473	TRANSISTOR	DTA124ES
	Q481, 482	TRANSISTOR	2SD2144S
	Q483	TRANSISTOR	DTA124ES
	Q484	TRANSISTOR	DTC124ES
	Q51	TRANSISTOR	2SA933S
⚠	D15	BRIDGE RECTIFIER	2W02-5008-L
	D201		MTZ6.2B
⚠	D21-24	DIODE	11ES2
	D371-373	DIODE	1SS254
	D391-397	DIODE	1SS254
	D471, 472	DIODE	1SS254
	D481, 482	DIODE	1SS254
⚠	D51, 52	DIODE	11ES2
⚠	D53		MTZ22B
⚠	D54		MTZ7.5B
		CAPACITORS	
	C101, 102	ELECTR. CAPACITOR	CEAS101M10
	C103	CERAMIC CAPACITOR	CCCCH180J50
	C104	ELECTR. CAPACITOR	CEAS101M10
	C105, 106	ELECTR. CAPACITOR	CEAS101M50
	C109	CERAMIC CAPACITOR	CKCYB152K50
	C151, 152	ELECTR. CAPACITOR	CEAS330M50
	C153, 154	ELECTR. CAPACITOR	CEAS330M16
	C155	MYLOR FILM CAPACITOR	CQMA182J50
	C156	MYLOR FILM CAPACITOR	CQMA333K50
	C157	MYLOR FILM CAPACITOR	CQMA103K50
	C158, 159	MYLOR FILM CAPACITOR	CQMA104K50
	C160	ELECTR. CAPACITOR	CEAS4R7M50
	C161	MYLOR FILM CAPACITOR	CQMA104K50
	C162	ELECTR. CAPACITOR	CEAS010M50
	C163	MYLOR FILM CAPACITOR	CQMA104K50
	C164	MYLOR FILM CAPACITOR	CQMA103K50
	C166	CERAMIC CAPACITOR	CCCSL101J50
	C167	CERAMIC CAPACITOR	CKCYF103Z50
	C168	MYLOR FILM CAPACITOR	CQMA333K50
	C169	MYLOR FILM CAPACITOR	CQMA103K50
	C170	MYLOR FILM CAPACITOR	CQMA332J50
	C171, 172	MYLOR FILM CAPACITOR	CQMA472J50
	C202	CERAMIC CAPACITOR	CKCYF103Z50
	C206	MYLOR FILM CAPACITOR	CQMA104K50
	C21	ELECTR. CAPACITOR	CEAS222M16
	C211	MYLOR FILM CAPACITOR	CQMA103K50
	C216, 217	ELECTR. CAPACITOR	CEAS470M50
	C22	ELECTR. CAPACITOR	CEAS222M16
	C221, 222	ELECTR. CAPACITOR	CEAS470M50
	C23, 24	ELECTR. CAPACITOR	CEAS102M16
	C25, 26	ELECTR. CAPACITOR	CEAS102M25
	C27, 28	ELECTROLYTIC CAPACIT	CEAS471M16
	C301, 302	ELECTR. CAPACITOR	CEAS470M50
	C303	ELECTR. CAPACITOR	CEAS330M16
	C306	CERAMIC CAPACITOR	CKCYB152K50
	C307	MYLOR FILM CAPACITOR	CQMA473J50
	C308	MYLOR FILM CAPACITOR	CQMA103K50
	C309	ELECTR. CAPACITOR	CEASR47M50
	C331	MYLOR FILM CAPACITOR	CQMA104K50
	C332	CERAMIC CAPACITOR	CKCYF103Z50

Mark	NO	Description	Part NO.
	C333	CERAMIC CAPACITOR	CCCSL221J50
	C351	ELECTR. CAPACITOR	CEAS101M10
	C352	CERAMIC CAPACITOR	CGCYF473Z25
	C353	CERAMIC CAPACITOR	CKCYF103Z50
	C371	ELECTR. CAPACITOR	CEAS330M16
	C372, 373	CERAMIC CAPACITOR	CKCYF103Z50
	C375	CERAMIC CAPACITOR	CKCYF103Z50
	C376	ELECTR. CAPACITOR	CEAS330M16
	C378	CERAMIC CAPACITOR	CKDYF103Z50
	C379	CERAMIC CAPACITOR	CGCYF473Z25
	C391	CERAMIC CAPACITOR	CKCYF103Z50
	C392	CERAMIC CAPACITOR	CCCSL101J50
	C393	CERAMIC CAPACITOR	CKCYF103Z50
	C394	CERAMIC CAPACITOR	CCCSL101J50
	C401	ELECTR. CAPACITOR	CEAS330M16
	C402, 403	CERAMIC CAPACITOR	CCCCH150J50
	C405	CERAMIC CAPACITOR	CGCYF473Z25
	C406	CERAMIC CAPACITOR	CCCSL101J50
	C407	CERAMIC CAPACITOR	CKCYF103Z50
	C411, 412	ELECTR. CAPACITOR	CEAS330M16
	C413, 414	ELECTR. CAPACITOR	CEAS470M50
	C415, 416	ELECTR. CAPACITOR	CEAS3R3M50
	C417, 418	MYLOR FILM CAPACITOR	CQMA102J50
	C421	CERAMIC CAPACITOR	CGCYF473Z25
	C431, 432	ELECTR. CAPACITOR	CEAS101M50
	C433, 434	MYLOR FILM CAPACITOR	CQMA332J50
	C435, 436	MYLOR FILM CAPACITOR	CQMA471J50
	C437, 438	MYLOR FILM CAPACITOR	CQMA182J50
	C439, 440	ELECTROLYTIC CAPACIT	CENA470M50
	C441, 442		CQSF102J50
	C461, 462	ELECTR. CAPACITOR	CEAS330M16
	C471	MYLOR FILM CAPACITOR	CQMA683J50
	C472	MYLOR FILM CAPACITOR	CQMA683J50
	C51, 52	ELECTR. CAPACITOR	CEAS101M50
	C53, 54	ELECTR. CAPACITOR	CEAS470M50
	C61	ELECTR. CAPACITOR	CEASR33M50
	C62	ELECTR. CAPACITOR	CEAS010M50
RESISTORS			
	VR102	Semi-fixed(22kΩ)	VRTB6VS223
	VR103	Semi-fixed(1kΩ)	VRTB6VS102
	VR151, 152	Semi-fixed(22kΩ)	VRTB6VS223
	VR411, 412	Semi-fixed(100kΩ)	VRTB6VS104
	R445-448		RD1/4PM391J
	Other resistors		RD1/6PM□□□J
OTHERS			
	X351		FCR4.0MC
	X401	XTAL RES (OSC)	PSS1001
	JA391, 392	JACK(CONTROL IN/OUT)	RKN1004
	JA393	JACK(DECK SYNCHRO)	RKN1014
	JA401	JACK(LINE OUT)	PKB1010
	CN101	CONNECTOR	52045-1610
	CN11		KPC9
	CN371	CONNECTOR	HLEM23S-1

Power Switch Board Assembly

SEMICONDUCTOR

	D701		SLH-56VC3H

SWITCH

	S738	SWITCH(POWER)	PSG1006

Mark	NO	Description	Part NO.

Transformer Board Assembly

CAPACITORS

	C11-18	CERAMIC CAPACITOR	CKCYF103Z50

Headphone Board Assembly

CAPACITORS

	C503, 504	CERAMIC CAPACITOR	CKCYF102Z50
	C505	CERAMIC CAPACITOR	CKCYF103Z50

RESISTORS

	VR501	VARIABLE RESISTOR (PHONES LEVEL)	PCS1003
	R501, 502	CARBONFILM RESISTOR	RD1/6PM121J

OTHERS

	JA501	JACK(PHONES)	RKN1001

◉Function board Assembly (PWZ1854)

SEMICONDUCTORS

	IC701	MICROCOMPUTER	PDG036
	Q704-Q706	TRANSISTOR	2SC1740S

SWITCHES

	S701-737	SWITCH	PSG1006

TIME, STORE, DELETE, PGM, DISC 1-6
REPEAT, ERASE, 1-10, +10, ≧20,
TIME FADE, AUTO PGM, EJECT(▲),
STOP(■), PAUSE(❚❚), PLAY(▶),
TRACK SEARCH(|◀◀,▶▶|),
AUTO FADER(↗, ↘), RANDOM PLAY,
MANUAL SEARCH(◀◀,▶▶)

CAPACITORS

	C701	ELECTR. CAPACITOR	CEAS330M16
	C702, 703		CKPUYF223Z25

RESISTORS

	All resistors		RD1/6PM□□□J

OTHERS

	V701	FL INDICATOR TUBE	PEL1040
	X701	CERAMIC RESONATOR	VSS1014
	CN701	CONNECTOR	HLEM23R-1
		REMOTE SENSOR	SBX1610-51

Select Board Assembly

SWITCH

	S605, 606	SWITCH(DISC POSITION)	PSH1008

Switch Board Assembly

SWITCH

	S601-604	SWITCH (LOADING POSITION, MAGAZINE)	PSH1008

7. ADJUSTMENTS

Except for the details given in this service manual, adjustment methods for the PD-M630 are the same as those for the PD-M530 (Order No. ARP2000).

1–1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP 1, Pin 6 (FCS, ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP 1, Pin 2 (TRK, ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP 1, Pin 2 (TRK, ERR)	VR102 (TRK. BAL)
4	Pick up radial/ Tangential direction tilt adjustment	TP 1, Pin 1 (RF)	Radial tilt adjustment screw Tangential tilt adjustment screw
5	RF level adjustment	TP 1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP 1, Pin 5 (FCS, IN) TP 1, Pin 6 (FCS, ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP 1, Pin 3 (TRK, IN) TP 1, Pin 2 (TRK, ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP 1, Pin 6 (FCS, ERR)	——
9	MSB adjustment	Audio output terminal (Pin out)	VR412 (MSB. Lch) VR411 (MSB. Rch)

1–2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low-pass filter (39 kΩ + 0.001 μF)
5. Resistor (100 kΩ)
6. Standard tools

1–3 Test point and adjustment location

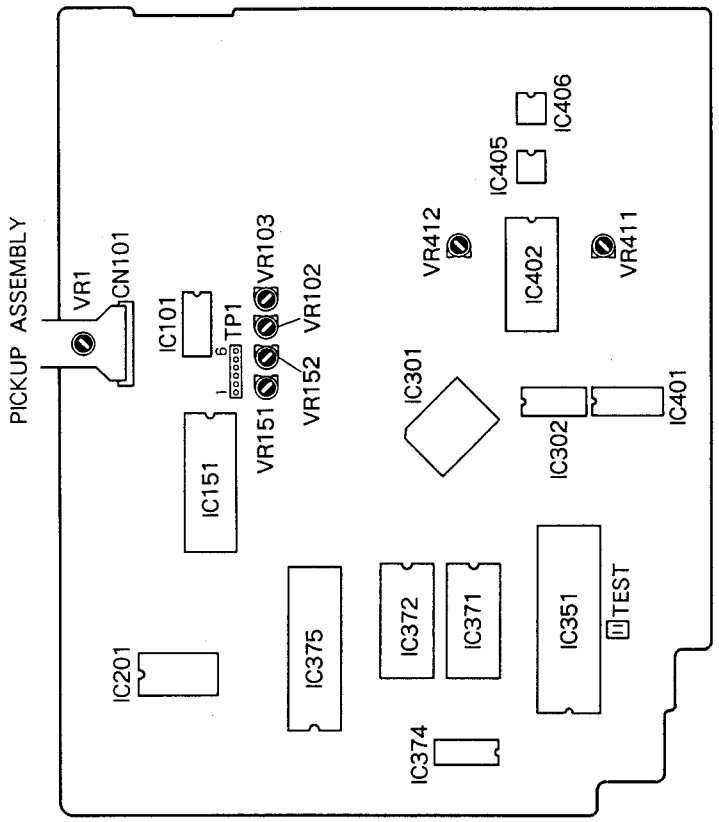


Figure 1

1–4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1–5 Test mode

This model has a test mode so that the adjustments and checks required for service can be carried out easily. When this model is in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For this model, all adjustments are carried out in test mode.

[Set this model to test mode]

Here is how to put this model into test mode.

1. Unplug the power cord from the AC socket.
2. Short the test mode jumper lines. (See Figure 1.)
3. Plug the power cord back into the AC socket.

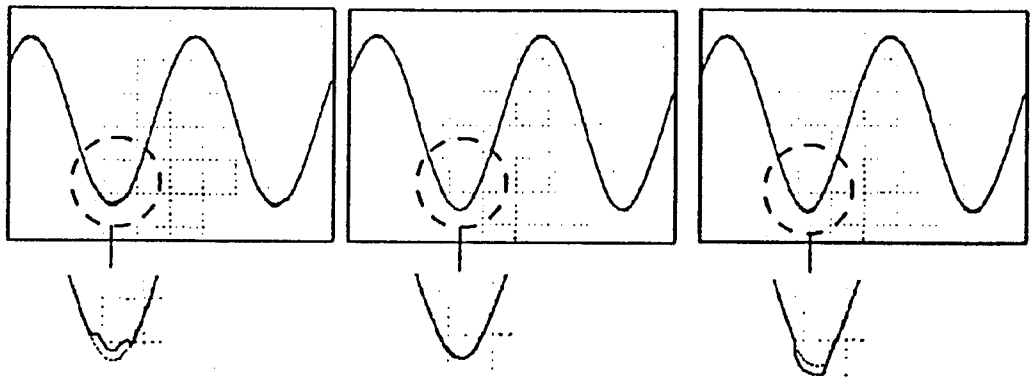
When the test mode is set correctly, the display is different from what it usually is when the power is switched on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1 and 3.

9. MSB adjustment

• Objective	To optimize the MSB adjustment when the D/A converter has been replaced.		
• Symptoms when the MSB is out of adjustment	Increased distortion in playback signals		
• Measurement instrument connections	Connect the oscilloscope to the audio output pin (pin out). [Settings] 10 mV/division 0.2 ms/division DC mode	• Player state	Normal mode, play
		• Adjustment locations	VR412 (MSB, left channel) VR411 (MSB, right channel)
		• Disc	YEDS-7

[Procedure]

1. Play back Track No. 19 (1 kHz, -20 dB).
2. Using the remote controller that comes with the PD-M630, set the attenuation on the display to -21 dB.
3. Adjust VR412 (MSB left channel) and VR411 (MSB right channel) so that the bottom tip of the playback wave is a smooth sine curve with no distortion.



Out of adjustment　　Best　　Out of adjustment

[How to set the attenuator if there is no remote controller]

The attenuation can be controlled by shorting the leads for IC701 of the function board ass'y.

Increasing the attenuation : each time IC701 Pins 27 (Point A) and 16 (Point B) are shorted together for a moment, the attenuation is increased 1 dB.

Decreasing the attenuation : each time IC701 Pins 27 (Point A) and 19 (Point C) are shorted together for a moment, the attenuation is decreased 1 dB.

[Precaution]

When carrying out this operation, short Points A, B, and C shows in Figure 15. (See Page 32.)

1–6 Test point and adjustment variable resistor positions
Point de test et positions de réglage de la résistance variable
Ubicación de los puntos de prueba y de los resistores variables de ajuste

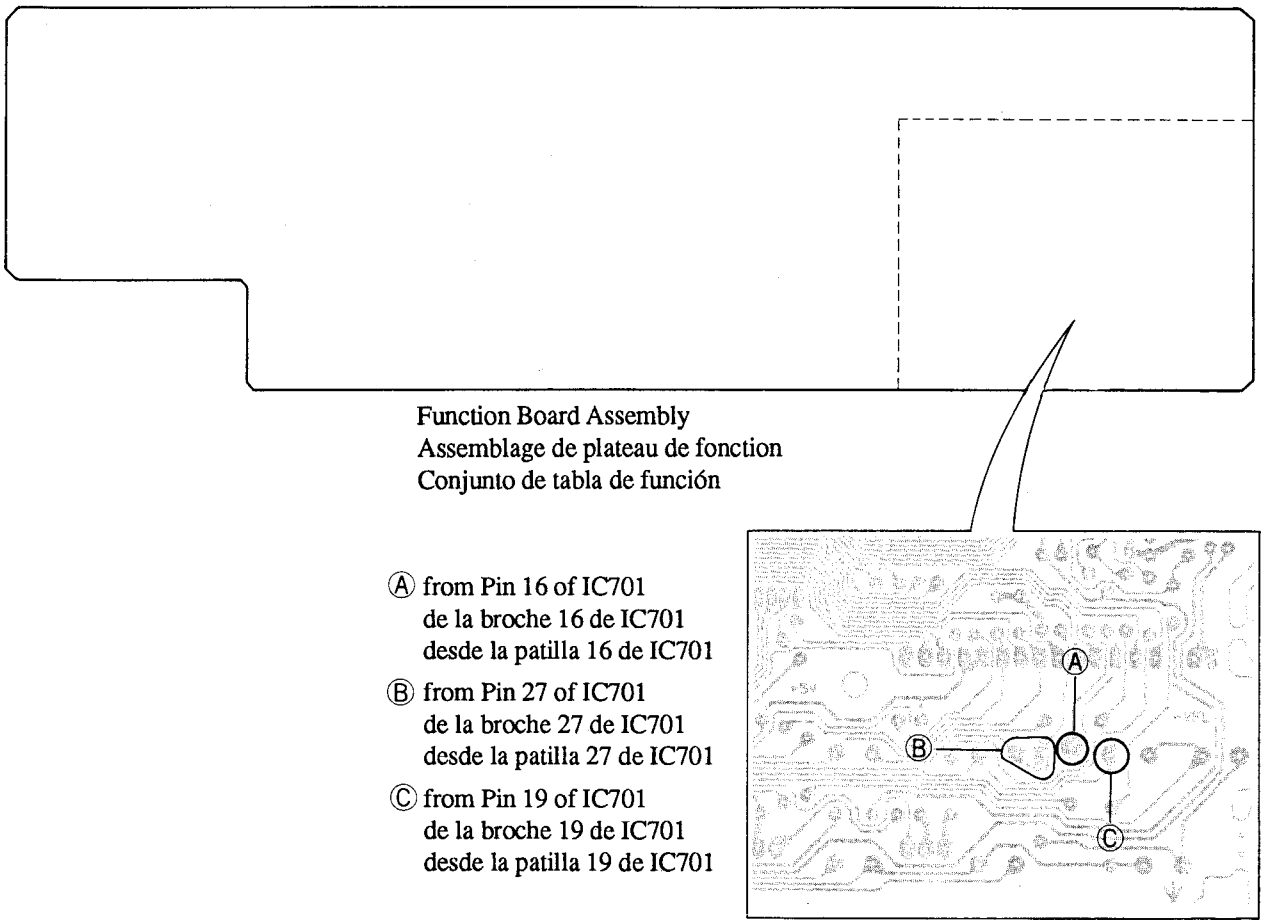

Function Board Assembly
Assemblage de plateau de fonction
Conjunto de tabla de función
Ⓐ from Pin 16 of IC701
de la broche 16 de IC701
desde la patilla 16 de IC701
Ⓑ from Pin 27 of IC701
de la broche 27 de IC701
desde la patilla 27 de IC701
Ⓒ from Pin 19 of IC701
de la broche 19 de IC701
desde la patilla 19 de IC701
Ⓐ
Ⓑ
Ⓒ

Figure 15 Adjustment Locations
Figure 15 Emplacements des réglages
Figura 15 Ubicaciones de ajuste

7. RÉGLAGE

A l'exception des détails fournis dans ce manuel d'entretien, les méthodes de réglage du PD-M630 sont identiques à celles du PD-M530 (N° d'ordre ARP 2000).

1-1 Paramètres de réglage/Points de vérification et d'ordre

Etape	Paramètre	Point de test	Emplacement du réglage
1	Réglage de décalage de la mise au point	TP 1, Broche 6 (FCS, ERR)	VR103 (FCS. OFS)
2	Réglage de diffraction	TP 1, Broche 2 (TRK, ERR)	Fente de réglage de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP 1, Broche 2 (TRK, ERR)	VR102 (TRK. BAL)
4	Réglage de l'inclinaison de la direction tangentielle/ Radiale du capteur	TP 1, Broche 1 (RF)	Vis de réglage de l'inclinaison radiale Vis de réglage de l'inclinaison tangentielle
5	Réglage du niveau RF	TP 1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de la boucle asservie de la mise au point	TP 1, Broche 5 (FCS, IN) TP 1, Broche 6 (FCS, ERR)	VR152 (FCS. GAN)
7	Réglage de gain de la boucle asservie de l'alignement	TP 1, Broche 3 (TRK, IN) TP 1, Broche 2 (TRK, ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de mise au point	TP 1, Broche 6 (FCS, ERR)	——
9	Réglage MSB	Borne de sortie audio (sortie à broche)	VR412 (MSB, canal gauche) VR411 (MSB, canal droit)

1-2 Instruments et outils de mesure

1. Oscilloscope cathodique à 2 faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque de test (YEDS-7)
4. Filtre passe-bas (39 kΩ + 0,001 μF)
5. Résistance (100 kΩ)
6. Outils standard

1–3 Emplacement du point de test et de réglage

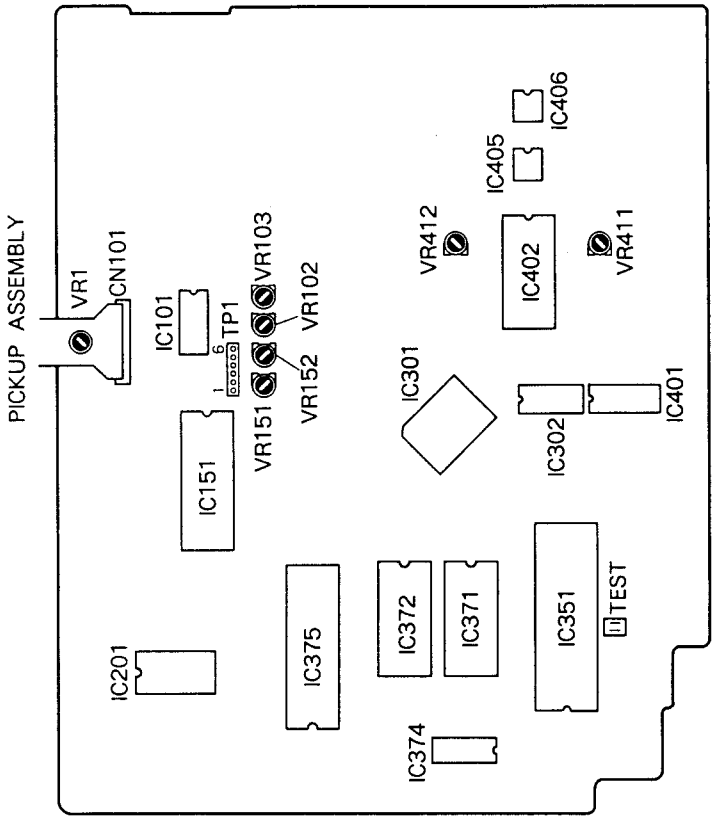


Figure 1

1–4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions du bouton (réglages) de l'oscilloscope dans les démarches de réglage sont opérantes quand une sonde de 10:1 est employée.

1–5 Mode de test

Ce modèle est doté d'un mode de test, de façon que les réglages et les vérifications requis pour l'entretien puissent être effectués aisément. Quand ce modèle est en mode de test, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent se réaliser par enclenchement de ces touches, en suivant les démarches adéquates. Dans le cas de ce modèle, tous les réglages sont effectués en mode de test.

[Etablissement du mode de test]

Voici les démarches décrivant comment mettre en modèle en mode de test.

1. Débrancher le cordon d'alimentation de la prise secteur CA.
2. Court-circuiter les lignes de cavalier du mode de test (voir Figure 1).
3. Rebrancher le cordon d'alimentation dans la prise secteur CA.

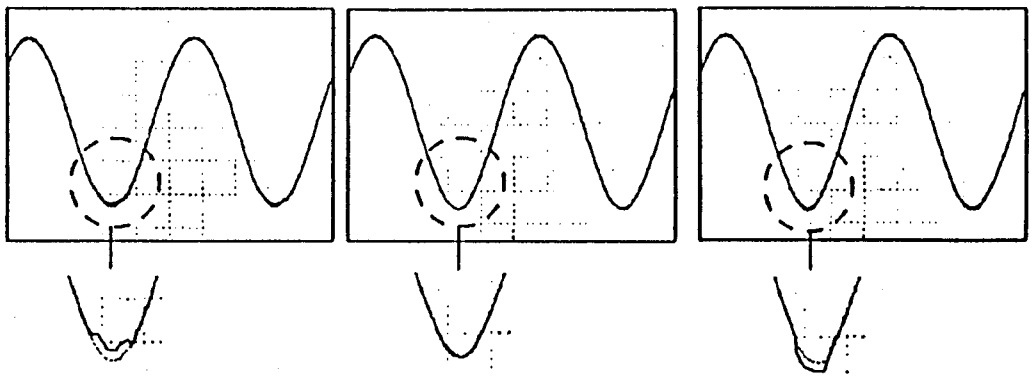
Quand le mode de test est réglé correctement, l'affichage obtenu n'est pas celui qui apparaît habituellement à l'enclenchement de l'interrupteur. Si l'affichage est identique, c'est que le mode de test n'est pas correctement réglé. Dans ce cas, répéter les étapes 1 et 3.

9. Réglage MSB

• Objectif	Pour optimaliser le réglage MSB quand le convertisseur N/A a été installé.		
• Symptômes quand le MSB n'est plus correctement réglé	Augmentation de la distorsion dans les signaux de lecture		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à la broche de sortie audio (sortie à broche)	• Etat du lecteur	Mode normal, lecture
	[Réglages] 10 mV/division 0,2 ms/division mode CC	• Emplacements des réglages	VR412 (MSB, canal gauche) VR411 (MSB, canal droit)
		• Disque	YEDS-7

[Marche à suivre]

1. Lecture de la piste n°19 (1 kHz, –20 dB)
2. A l'aide de la télécommande fournie avec le PD-M630, régler l'atténuation de l'affichage sur –21 dB.
3. Ajuster VR412 (MSB, canal gauche) et VR411 (MSB, canal droit) de façon que l'extrémité de l'onde de lecture devienne une courbe sinusoïdale sans distorsion.



Mal réglé Optimal Mal réglé

[Réglage de l'atténuateur sans télécommande]

Il est possible de contrôler l'atténuation en court-circuitant les fils de IC701 de l'assemblage de la plaquette de fonction.

Augmentation de l'atténuation : chaque fois que les broches 27 (point A) et 16 (point B) de IC701 sont court-circuitées ensemble pendant un moment, l'atténuation augmente d'1 dB.

Diminution de l'atténuation : chaque fois que les broches 27 (point A) et 19 (point C) de IC701 sont court-circuitées ensemble pendant un moment, l'atténuation diminue d'1 dB.

[Précaution]

Pendant la réalisation de cette opération, court-circuiter les points A, B et C comme illustré à la Fig. 15 (voir page 32).

7. AJUSTES

Excepto en cuanto a los detalles ofrecidos en este manual de servicio, los métodos de ajuste del PD-M630 son iguales que los del PD-M530 (N.° de pedido ARP 2000).

1–1 Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Ubicación de ajuste
1	Ajuste de descentramiento del enfoque	TP 1, Patilla 6 (FCS, ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP 1, Patilla 2 (TRK, ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de error de seguimiento	TP 1, Patilla 2 (TRK, ERR)	VR102 (TRK. BAL)
4	Ajuste de inclinación en sentido radial/ Tangencial del captor	TP 1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP 1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP 1, Patilla 5 (FCS, IN) TP 1, Patilla 6 (FCS, ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP 1, Patilla 3 (TRK, IN) TP 1, Patilla 2 (TRK, ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP 1, Patilla 6 (FCS, ERR)	——
9	Ajuste de MSB	Terminal de salida de audio (patilla OUT)	VR412 (MSB, canal izuquierdo) VR411 (MSB, canal derecho)

1–2 Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo (39 kΩ + 0,001 μF)
5. Resistor (100 kΩ)
6. Herramientas estándar

1-3 Ubicación de los puntos de prueba y de ajuste

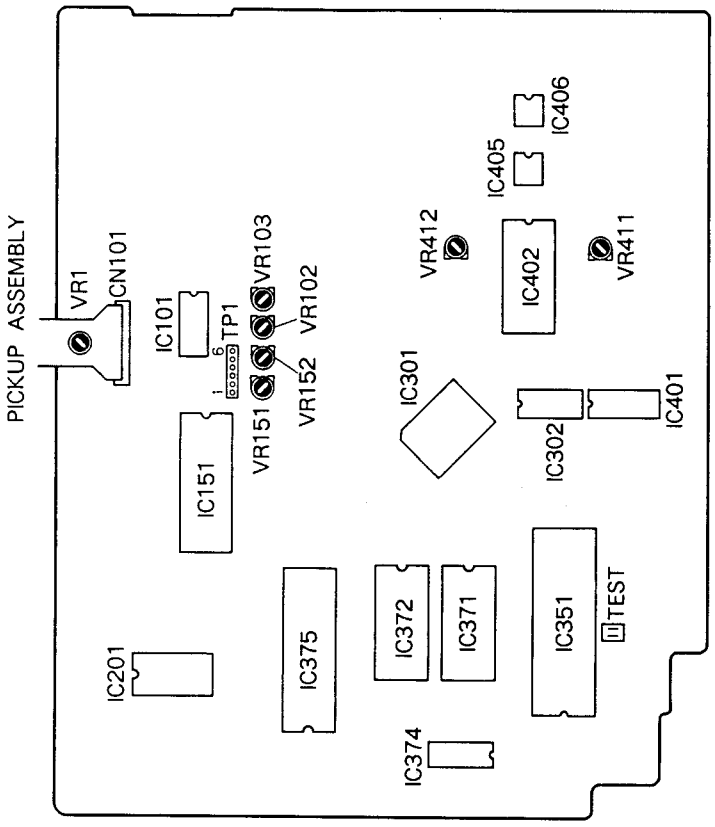


Figure 1

1-4 Notas

1. Emplee la sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando emplee una sonda de 10:1.

1-5 Modo de prueba

Este modelo posee un modo de prueba en el que los ajustes y las comprobaciones requeridos para el trabajo de servicio pueden realizarse fácilmente.

Cuando este modelo esté en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y comprobaciones podrán realizarse empleando estas teclas de acuerdo con el procedimiento correcto. Para este modelo, todos los ajustes se realizan en el modo de prueba.

[Puesta de este modelo en el modo de prueba]

A continuación se indica cómo poner este modelo en el modo de prueba.

1. Desenchufe el cable de alimentación de la toma de CA.
2. Cortocircuite las líneas de puenteado del modo de prueba. (Consulte la figura 1.)
3. Enchufe el cable de alimentación de la toma de CA.

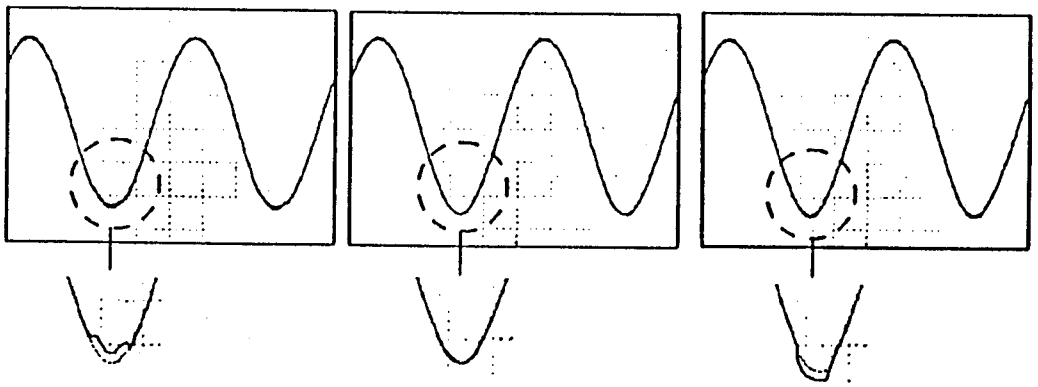
Cuando haya establecido correctamente el modo de prueba, la visualización será diferente a la usual que aparece cuando se conecta la alimentación. Si la visualización sigue siendo la misma que la usual, el modo de prueba no se habrá establecido correctamente, por lo que tendrá que repetir los pasos 1 y 3.

9. Ajuste de MSB

• Objetivo	Optimizar el ajuste de MSB cuando se haya reemplazado el convertidor D/A.		
• Síntomas cuando MSB esté fuera de ajuste	Incremento de la distorsión en las señales de reproducción		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a la patilla de salida de audio (patilla OUT) [Ajustes] 10 mV/división 0,2 ms/división modo de CC	• Estado del reproductor	Modo normal, reproducción
		• Ubicaciones de ajuste	VR412 (MSB, canal izquierdo) VR411 (MSB, canal derecho)
		• Disco	YEDS-7

[Procedimiento]

1. Reproducción de la pista número 19 (1 kHz, -20 dB).
2. Empleando el controlador remoto suministrado con el PD- M630, ajuste la atenuación en el visualizador a -21 dB.
3. Ajuste VR412 (MSB, canal izquierdo) y VR411 (MSB, canal derecho) hasta que la punta inferior de la onda de reproducción sea una onda senoidal suave sin distorsión.



Fuera de ajuste　　Condición óptima　　Fuera de ajuste

[Cómo ajustar el atenuador si no dispone de controlador remoto]

La atenuación podrá controlarse cortocircuitando los conductores para IC701 del conjunto de la tarjeta de función.

Aumento de la atenuación:Cada vez que cortocircuite momentáneamente las patillas 27 (punto A) y 16 (punto B) de IC701, la atenuación aumentará 1 dB.

Disminución de la atenuación:Cada vez que cortocircuite momentáneamente las patillas 27 (punto A) y 19 (punto C) de IC701, la atenuación disminuirá 1 dB.

[Precaución]

Cuando realice esta operación, cortocircuite los puntos A, B, y C como se muestra en la figura 15.
(Consulte la página32.)

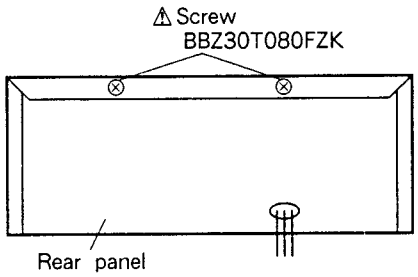
8. FOR KC, HEM AND HB TYPES

NOTES :
- Parts without part number cannot be supplied.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5 %, and K = 10 %).
560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

CAUTION : About the locking screw of the bonnet for HB type.



① As to HB types, the locking screw (Part No. BBZ30T080FZK) for install the bonnet should be used.
② When the locking screw is removed or tightened, use the "TORX SCREW DRIVER, SIZE T10"

8.1 CONTRAST OF MISCELLANEOUS PARTS

The KC, HEM and HB types are the same as the KU type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		KU type	KC type	HEM type	HB type	
◉	Main board assembly	PWZ1843	PWZ1843	PWZ1844	PWZ1844	
	Transformer board assembly	Non supply	Non supply	Non supply	Non supply	
◉	Function board assembly	PWZ1854	PWZ1854	PWZ1853	PWZ1853	
⚠	Strain relief	CM-22C	CM-22C	CM-22B	CM-22B	
⚠	AC power cord	PDG1002	PDG1002	PDG1003	PDG1004	
⚠	Power transformer (AC120V)	PTT1143	PTT1143	• • • • •	• • • • •	
⚠	Power transformer (AC220V, 240V)	• • • • •	• • • • •	PTT1144	PTT1144	
	CD packing case	PHG1442	PHG1443	PHG1443	PHG1443	For packing
	Operating instructions (Englesh)	PRB1123	PRB1123	• • • • •	PRB1131	
	Operating instructions (French)	• • • • •	PRC1023	• • • • •	• • • • •	
	Operating instructions (English/French/German/Italian)	• • • • •	• • • • •	PRE1122	• • • • •	
	Operating instructions (Dutch/Swedish/Spanish/Portuguese)	• • • • •	• • • • •	PRF1035	• • • • •	
	Display screen	PAM1373	PAM1373	PAM1416	PAM1416	
	Flexible cable (23P)	PDD1058	PDD1058	• • • • •	• • • • •	
	Flexible cable (21P)	• • • • •	• • • • •	PDD1059	PDD1059	
	Connection cord with mini plug	PDE-319	PDE-319	• • • • •	• • • • •	
	Single magazine assembly	PXA1043	PXA1043	• • • • •	• • • • •	
⚠	Screw	• • • • •	• • • • •	• • • • •	BBZ30T080FZK	For bonnet

Note : As to the SCHEMATIC DIAGRAM and P.C.BOARDS CONNECTION DIAGRAM of KC type, refer to those of KU type.

FUNCTION BOARD ASSEMBLY

The Function board assembly (**PWZ1853**) is the same as the Function board assembly (**PWZ1854**) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ1854	RWZ1853	
	CN701	HLEM23R-1	HLEM21R-1	
	C705	• • • • •	CKPUYF223Z25	

MAIN BOARD ASSEMBLY

The Main board assembly (**PWZ1844**) is the same as the Main board assembly (**PWZ1843**) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		PWZ1843	PWZ1844	
⚠	IC31,IC32	• • • • •	ICP-N10	
⚠	IC34	• • • • •	ICP-N15	
	D391 – D394	1SS254	• • • • •	
	C391	CKCYF103Z50	• • • • •	
	C392	CCCSL101J50	• • • • •	
	C379	CGDYF473Z25	• • • • •	
	R391	RD1/6PM244J	• • • • •	
	R392	RD1/6PM102J	• • • • •	
	CN371	HLEM23S-1	HLEM21S-1	
	JA391,JA392 (CONTROL IN/OUT)	RKN1004	• • • • •	

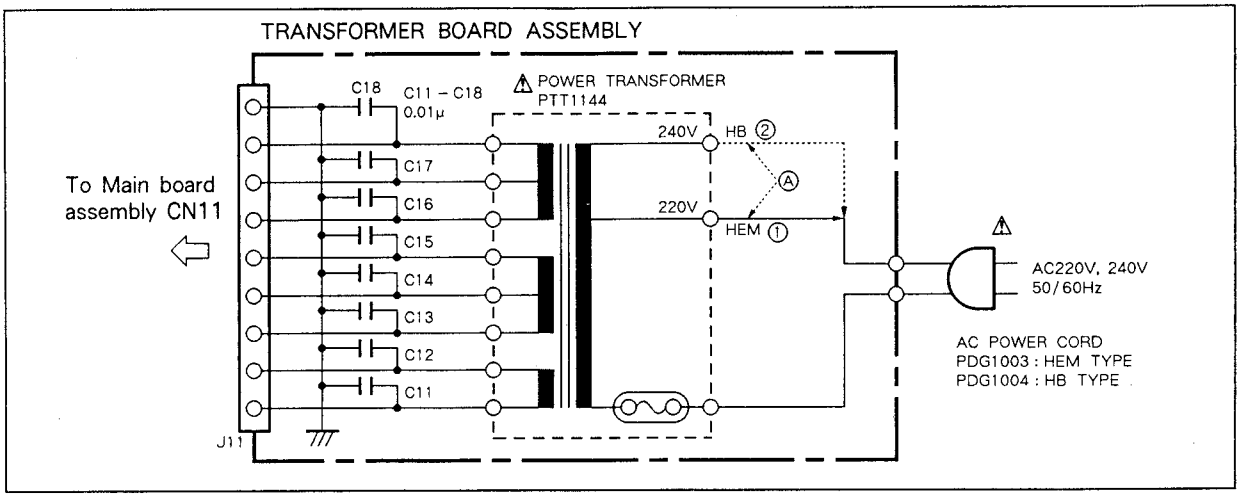
TRANSFORMER BOARD ASSEMBLY

The Transformer board assembly of HEM and HB types are the same as that of KU type. (See page 28)

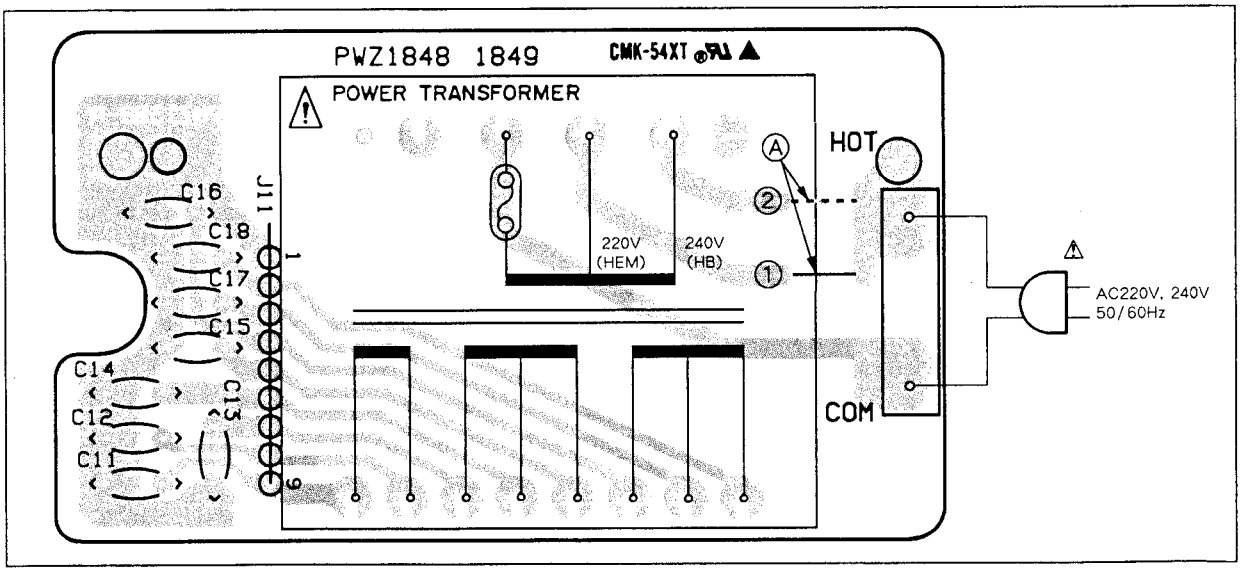
8.2 FOR HEM AND HB TYPES

Note : The schematic diagram and the P. C. boards pattern of the HEM and HB types are showed in the KU type with the exception of the power supply section. (Page 11 thru 26)

• SCHEMATIC DIAGRAM



• P. C. BOARD PATTERN



LINE VOLTAGE SELECTION

Line voltage can be changed with the following steps.

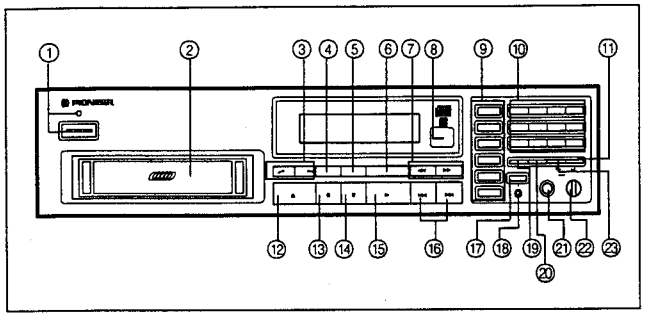
1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ as follows. (Refer to the transformer board assembly.)

Voltage	Jumper Ⓐ position
220V	①
240V	②

4. Stick the line voltage label on the rear panel.

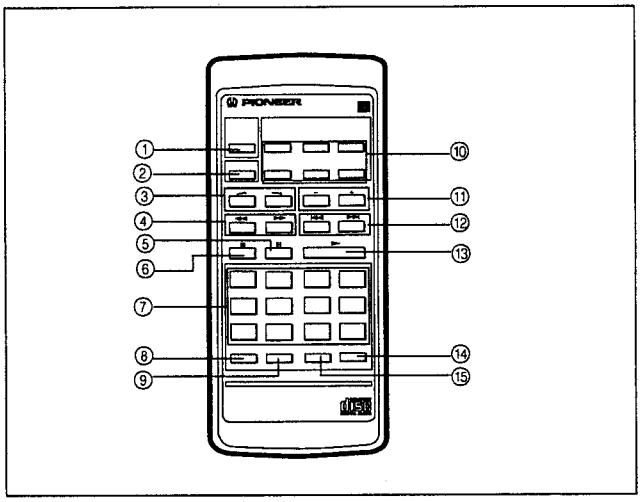
Part No.	Description
AAX-193	220V label
AAX-192	240V label

9. PANEL FACILITIES



FRONT PANEL

① **POWER STANDBY/ON switch and indicator**
② **Magazine insertion slot**
③ **AUTO FADER buttons**
④ **TIME button**
⑤ **REPEAT button**
⑥ **RANDOM PLAY button**
⑦ **MANUAL SEARCH buttons (◄◄/►►)**
⑧ **Remote sensor**
Receives the signal from the remote control unit.
⑨ **DISC NUMBER buttons (DISC 1 - DISC 6)**
⑩ **TRACK NUMBER/Digit buttons (1-10, +10, ≧20)**
⑪ **TIME FADE EDIT button**
⑫ **EJECT button (▲)**
⑬ **STOP/CLEAR button (■)**
⑭ **PAUSE button (II)**
⑮ **PLAY button (►)**
⑯ **TRACK search buttons (I◄◄/►►I)**
⑰ **MULTI MEMORY STORE button**
⑱ **MULTI MEMORY ERASE button**
⑲ **PGM button**
⑳ **DELETE button**
㉑ **Headphones jack (PHONES)**
㉒ **Headphones volume (PHONES LEVEL)**
㉓ **AUTO PGM EDIT button**



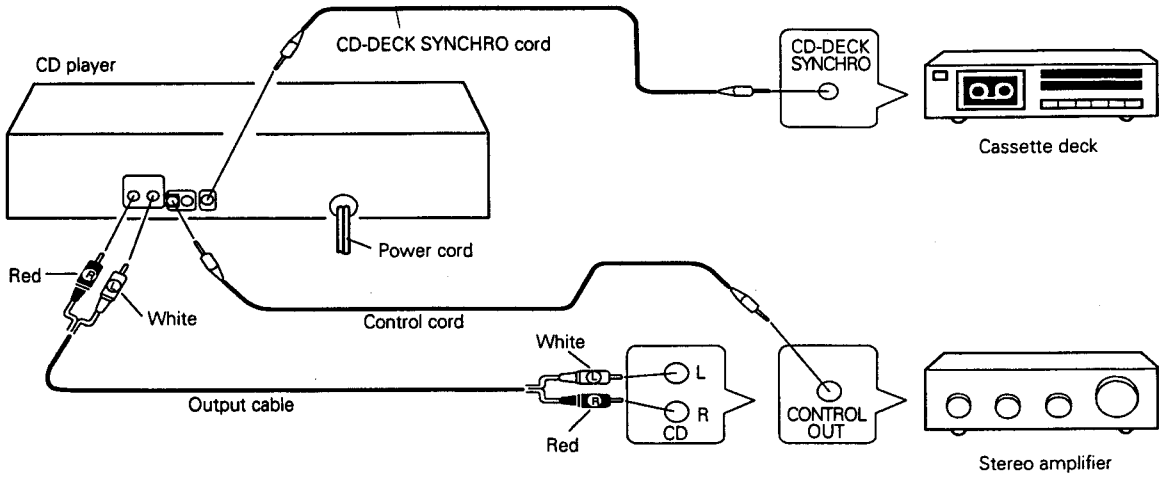
REMOTE CONTROL UNIT

Remote control buttons with the same names or marks as buttons on the front panel of the player control the same operations as the corresponding front panel buttons.

① **POWER button**
② **RANDOM PLAY button**
③ **FADE-IN/FADE-OUT buttons**
④ **MANUAL search buttons (◄◄/►►)**
⑤ **PAUSE button (II)**
⑥ **STOP button (■)**
⑦ **Track number/Digit buttons (1-10, +10, ≧ 20)**
⑧ **PGM button**
⑨ **CHECK button**
⑩ **DISC NUMBER buttons (1 - 6)**
⑪ **OUTPUT LEVEL buttons (+/–)**
⑫ **TRACK search buttons (I◄◄/►►I)**
⑬ **PLAY button (►)**
⑭ **DELETE button**
⑮ **CLEAR button**

CONNECTIONS

- Make sure that all of the components are turned off before making connections.



Making connections

1 Connect the OUTPUT jacks of this unit to the input jacks (CD or AUX) of the amplifier. Make sure that the white plugs are connected to the left (L) jacks and the red plugs to the right (R) jacks.
- Be sure not to connect this unit to the amplifier's PHONO jacks, as sound will be distorted and normal playback will not be possible.

2 Connect the power cord to a household AC wall outlet or an AC outlet on your amplifier.
- Make sure plugs are inserted fully into the jacks and wall outlet.

CD-Deck synchro function

If you have a Pioneer cassette deck provided with the CD-Deck synchro function, connect the CD-DECK SYNCHRO jacks of the CD player and cassette deck. With this function, synchro recording can be carried out between player and deck.
- For details on connections and operation, refer to the instruction manual supplied with the cassette deck.
- The CD-DECK SYNCHRO cord is not supplied with the CD player.

System remote control with a Pioneer stereo amplifier that has the 5R mark

(Available with U.S., Canadian and Australian models only)
When a Pioneer stereo amplifier bearing the 5R mark is used, connect the CONTROL IN jack on the rear panel of the CD player to the CONTROL OUT jack of the amplifier. This will enable the CD player to be controlled using the remote control unit supplied with the stereo amplifier. If you do not plan to use this feature, it is not necessary to connect CONTROL IN/OUT jacks.
- The control cord is supplied with the CD player.
- The remote control unit supplied with the amplifier can be used to control Play, Stop, Pause, Track/Disc Search and Disc Change operations.
- For instructions regarding connections and operation, refer to the operating instruction manual provided with your stereo amplifier.

NOTES:
- *When a control cord is connected to the player's CONTROL IN jack, direct control of the player with the remote control unit is not possible. Operate the player with the remote control unit by aiming it at the amplifier.*
- *Be sure to connect both of the control cord's plugs securely to the CONTROL IN and CONTROL OUT terminals. Do not connect only one end of the cable.*

10. SPECIFICATIONS

SPECIFICATIONS

1. General

Type ..... Compact disc digital audio system
Power requirements
European models ..... AC 220 V, 50/60 Hz
U.K., Australian models ..... AC 240 V, 50/60 Hz
U.S., Canadian models ..... AC 120 V, 60 Hz
Other models ..... AC 110/120 - 127/220/240 V (switchable) 50/60 Hz
Power consumption 14W
Operating temperature ..... +5°C - +35°C
Weight ..... 4.9 kg (10 lb, 13 oz)
External dimensions ..... 420(W) X 326(D) X 104(H) mm
16-9/16(W) X12-27/32(D) X 4-1/8(H) in

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... more than 107 dB (EIAJ)
Dynamic range ..... more than 97 dB (EIAJ)
Channel separation ..... more than 102 dB (EIAJ)
Harmonic distortion ..... less than 0.003% (EIAJ)
Output voltage 2.0V
Wow and flutter ..... less than ±0.001% (W.PEAK) (below measurable level) (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Audio line output
Headphone jack with volume control
Control input/output jacks (Equipped with U.S., Canadian and Australian models)
CD-DECK synchro jack

4. Functions

Number of discs to be stored - maximum 6.

Basic operation buttons
- PLAY, PAUSE, STOP

Search function
- Disc Search
- Track Search
- Manual Search

Programming
- Maximum 40 steps
- Pause
- Program check/Correction (remote control unit)
- Program CLEAR (single track or all tracks)
- Delete play

Repeat functions
- 1 track repeat
- All discs repeat
- Program repeat
- Random play repeat
- Delete play repeat
- Delete random play repeat
- Program random play repeat

Random play
- Random play (repeat also available)
- Delete random play (repeat also available)
- Program random play (repeat also available)

Switching display
- Time consumed, remaining time (track/disc), and total time

Timer start

Digital Level Controller
Volume control can be done with the remote control unit.

Level memory

One-touch Fade
Fade-in and fade-out possible.

Variable fade
The interval of fade-in/out can be specified.

Time Fade Editing
Selects the tracks within the specified time. Playback pauses with a fade-out.

Auto Program Editing
Selects the tracks within the specified time.

Multi-Memory
Stores programs/disc output level/TOC.

Remote control unit for program transmission
- Enables program transmission from remote control unit to player.

5. Display

FL tube display
- Elapsed time display (min, sec)
- Remaining time (track/disc) display
- Total time display
- Disc number, track number
- Program step number
- Program indicator
- Repeat indicator
- Random play indicator
- ATT level meter and display
- Time Fade Editing indicator
- Auto Program Editing indicator
- Delete indicator
- Multi-Memory TOC data/level/program/delete indicators
- Play indicator
- Pause indicator
- Disc symbol indicators

6. Accessories

- Remote control unit 1
- Size AAA/R03/dry batteries 2
- Six-compact-disc magazine 1
- Single-compact-disc magazine 1
(Except for U.K. and European models)
- Output cord 1
- Control cord 1
(U.S., Canadian and Australian models only)
- Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

The Magazine Type Multi-Play CD Players with mark and the Magazines with the same mark are compatible for 5-inch (12cm) discs

PIONEER®
The future of sound and vision.

Service Manual

ORDER NO.
ARP2000

ADJUSTMENT FOR CD PLAYERS VOL. 1

- This service manual explains compact disc player adjustment methods. The compact disc (CD) players covered by this service manual can be divided into three types: Single CD type, Twin-tray CD type, and Multi-play CD type. Typical models are:

Single CD type	Model PD-5500
Twin-tray CD type	Model PD-T505
Multi-play CD type	Model PD-M530

- For details on items other than adjustment methods, see the respective service manual.
- These adjustment methods can sometimes be used for models other than the typical models listed above. In such a case, follow the instructions in the respective service manual.
- Ce manual pour le service comprend les explications de réglage en français (voir page 20).
- Este manual de servicio trata del método ajuste escrito en español (consulte la página 38).

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PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
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FO MAR. 1990 Printed in Japan

1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pick up or the circuitry. Adjust correctly following the adjustment procedure.

1–1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP 1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP 1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP 1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pick up radial/ tangential direction tilt adjustment	TP 1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP 1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP 1, Pin 5 (FCS. IN) TP 1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP 1, Pin 3 (TRK. IN) TP 1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP 1, Pin 6 (FCS. ERR)	——

- Abbreviation table

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS. IN : Focus In
TRK. IN : Tracking In

1–2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes of recording)
   For Twin-tray CD type, an 8-cm disc (with at least about 20 minutes of recording) can also be used.
   For Multi-play CD type, use only the YEDS-7 test disc.
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Hexagonal wrench (M3 mm) (not used for Multi-play CD type)
8. Standard tools

1-3 Test point and adjustment variable resistor positions

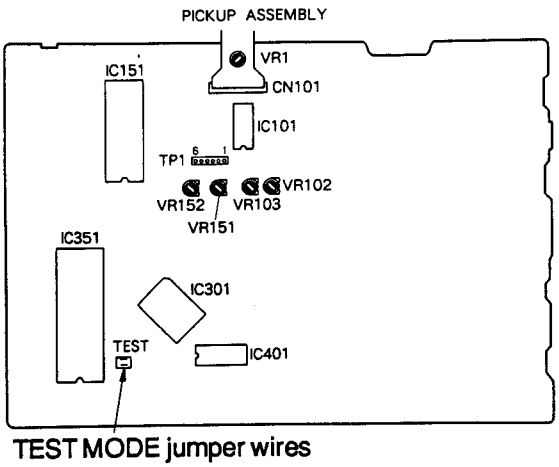


Figure 1 Single CD type Adjustment Locations

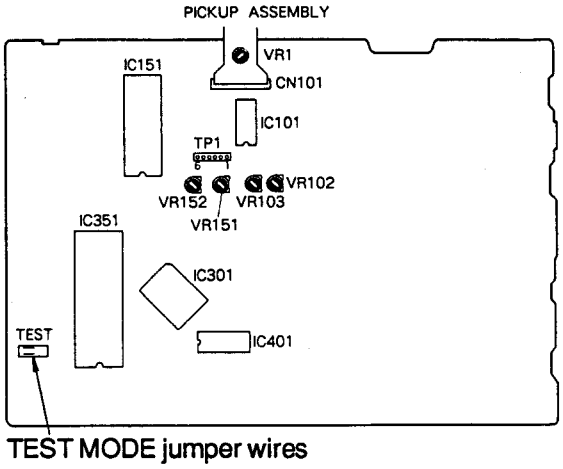


Figure 1 Multi-play CD type Adjustment Locations

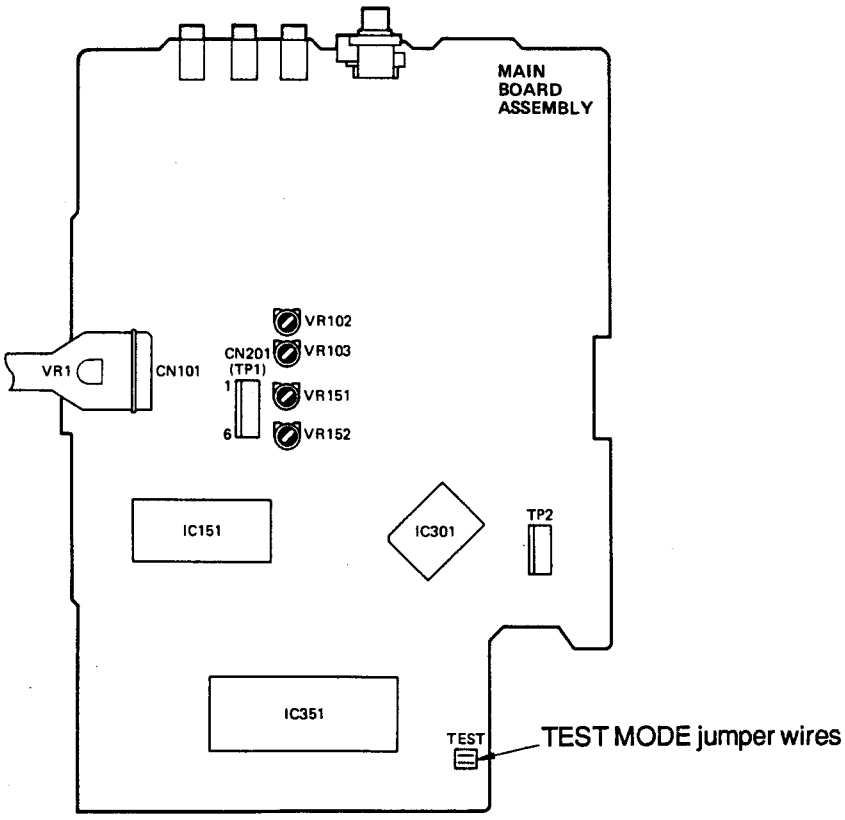


Figure 1 Twin-tray CD type Adjustment Locations

1–4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1–5 Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch. For Multi-play CD type, unplug the power cord from the AC socket.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch. For Multi-play CD type, plug the power cord back into the AC socket.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing the test mode:

1. Press the STOP key and stop all operations.
2. Turn off the power switch on the front panel.
   For Multi-play CD type, unplug the power cord from the AC socket.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
▷▷|	TRACK FWD	Focus servo close	For Twin-tray CD type only, if Disc Tray 1 is closed, Disc Tray 1 is moved to the play position. For Multi-play CD type only, Disc 1 is pulled out of the CD magazine and loaded. Then, no matter what the type, the laser diode is lit up and the focus actuator is lowered (*1), then raised slowly (*2) and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo makes when it operates. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down (*3), then the actuator is raised and lowered twice (*4) and returned to its original position. Note : For Multi-play CD type, the operations are reversed this way. *1: The focus actuator is lifted up. *2: Lowered slowly *3: Pulled up *4: Lowered and raised twice
▷	PLAY	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run wild. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is displayed.

Code	Key name	Function in test mode	Explanation
⏸	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key. Pressing this key when the tracking servo is closed opens it and pressing this key when the tracking servo is open closes it. This key has no effect if no disc is mounted.
⏪	MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏩	MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏹	STOP	Stop	Switches off all the servos and initializes. For Multi-play CD type, Disc 1 is stored into the magazine, then the player stops. The pickup remains where it was when this key was pressed.
⏏	OPEN/CLOSE DISC 1	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key. Pressing this key when the tray is closed opens it and pressing this key when the tray is open closes it. Pressing this key when the disc is turning stops the disc, then opens the tray. This key operation does not affect the position of the pickup.
	..... For Multi-play CD type		
	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos in order.

Here is the key operation sequence for playing back a disc in test mode.

TRACK FWD ⏭	Lights up the laser diode and closes the focus servo.
⇓	
PLAY ▷	Starts the spindle motor and closes the spindle servo.
⇓	
PAUSE ⏸	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

• Objective • Symptom when out of adjustment	Sets the DC offset for the focus error amp to 0 V. The player does not focus in and the RF signal is dirty.		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	• Player state • Adjustment location • Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is 0±50 mV.

2. Grating adjustment

• Objective	To align the tracking error generation laser beam spots to the optimum angle on the track		
• Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2)	• Player state	Test mode, focus and spindle servos closed and tracking servo open
	[Settings] 50 mV/division 5 ms/division DC mode	• Adjustment location	Pickup grating adjustment slit
		• Disc	12-cm disc. For Twin-tray CD type, an 8-cm disc can also be used. (YEDS-7 can not be used.) For Multi-play CD type, use the YEDS-7 test disc.

[Procedure]

- When adjusting Twin-tray CD type using a 12-cm disc, always remove the disc tray1. (*)

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD ⏩ or ⏪ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.

   Note : For Multi-play CD type, use the MANUAL SEARCH FWD ⏩ or ⏪ key to move the pickup to halfway across the disc (R = 35 mm).

2. Press the TRACK FWD ⏭ key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver counterclockwise (clockwise for Multi-play CD type) from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver counterclockwise (clockwise for Multi-play CD type) from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference : Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.
   Note : The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p), then the objective lens may be dirty or the pickup malfunctioning. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the MANUAL SEARCH REV ⏪ key, press the PAUSE ⏸ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

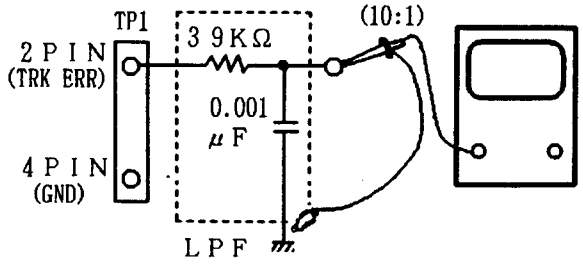
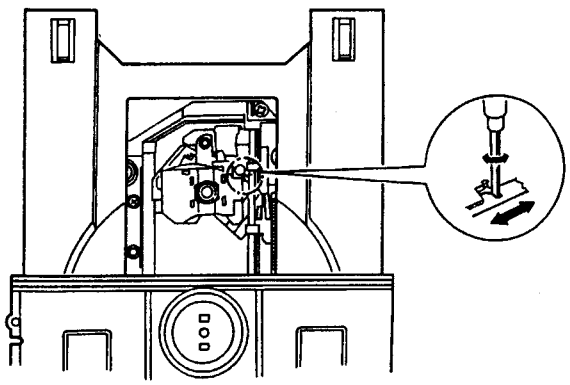
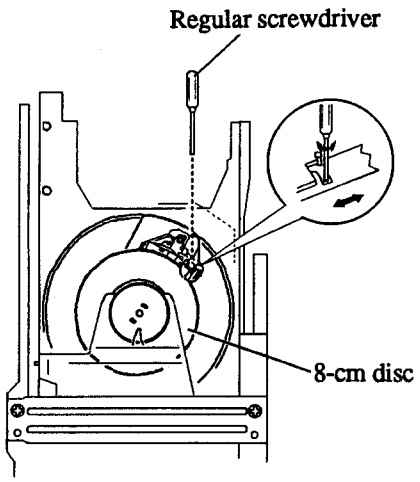


Figure 2

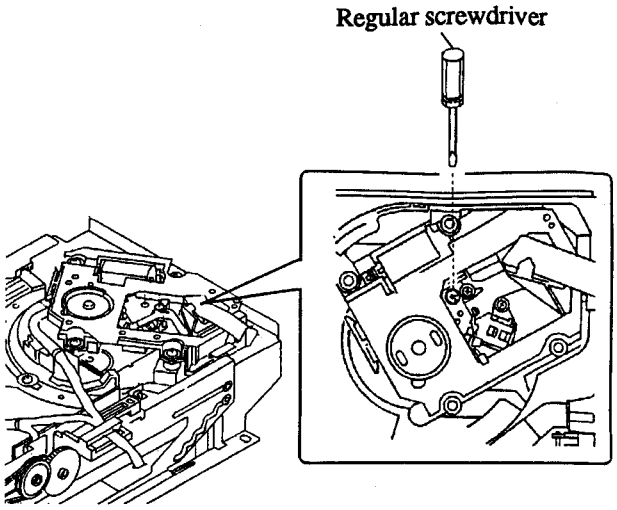


Single CD type adjustment locations

* : See Page 18.



Twin-tray CD type adjustment locations



Multi-play CD type adjustment locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

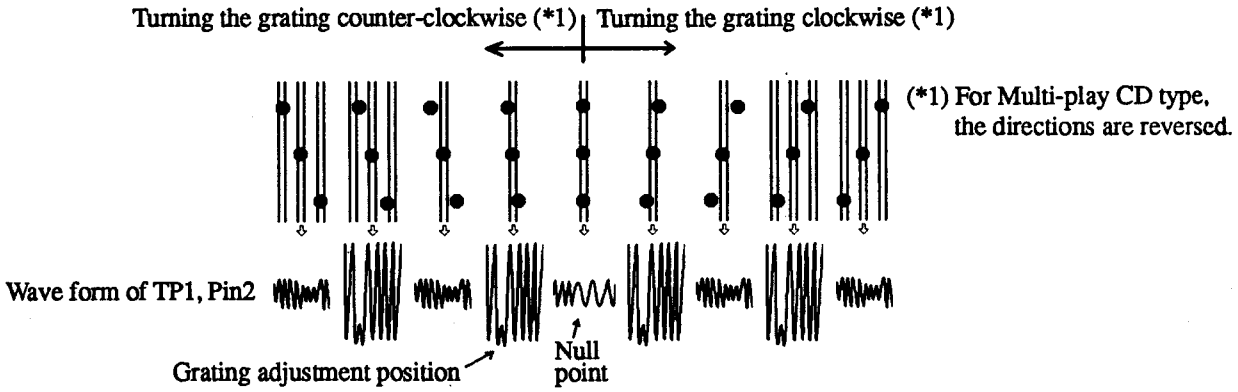
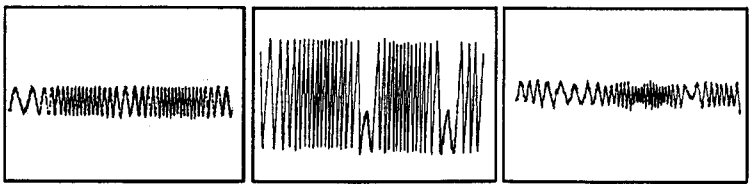

Turning the grating counter-clockwise (*1)
Turning the grating clockwise (*1)
(*1) For Multi-play CD type, the directions are reversed.
Wave form of TP1, Pin2
Grating adjustment position
Null point

Figure 3



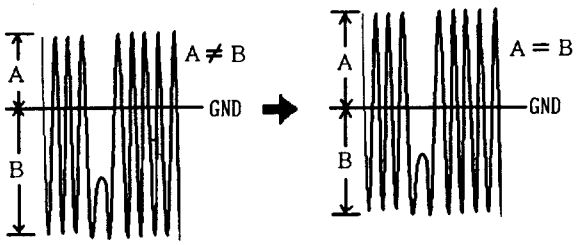
Null point wave form | Maximum amplitude wave form | Wave form other than the null point

3. Tracking error balance adjustment

• Objective • Symptom when out of adjustment	To correct for the variation in the sensitivity of the tracking photodiode Play does not start or track search is impossible		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	• Player state • Adjustment location • Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL SEARCH FWD ⏩ or ⏪ key.
2. Press the TRACK FWD ⏭ key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

• Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
• Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	• Player state	Test mode, play
		• Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		• Disc	12-cm disc. For Twin-tray CD type, an 8-cm disc can also be used. (YEDS-7 can not be used.) For Multi-play CD type, use the YEDS-7 test disc.

[Procedure]

- When adjusting Twin-tray CD type using a 12-cm disc, always remove the disc tray. (*)

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD ⏩ or ⏪ key so that the radial/tangential tilt screws can be adjusted.

   Note : For Multi-play CD type, use the MANUAL SEARCH FWD ⏩ or ⏪ key to move the pickup to halfway across the disc (R = 35 mm).

   Press the TRACK FWD ⏭ key, the PLAY key, then the PAUSE ▷ key in that order to close the focus servo then the spindle servo and put the player into play mode.

2. First, adjust the radial tilt adjustment screw with an M 3-mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly. For Multi-play CD type, use a Phillips screwdriver.

3. Next, adjust the tangential tilt adjustment screw with an M 3-mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5). For Multi-play CD type, use a Phillips screwdriver.

4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

   Note : Radial and tangential mean the directions relative to the disc shown in Figure 4.

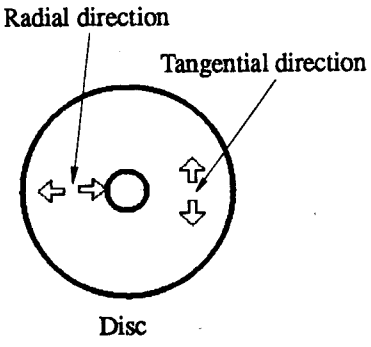
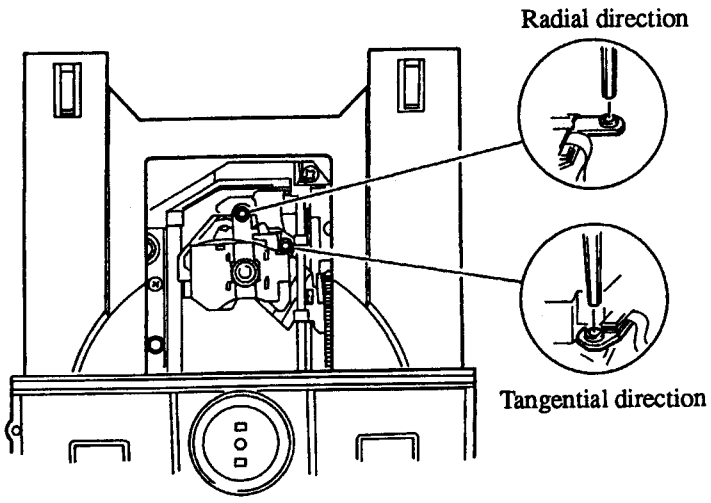
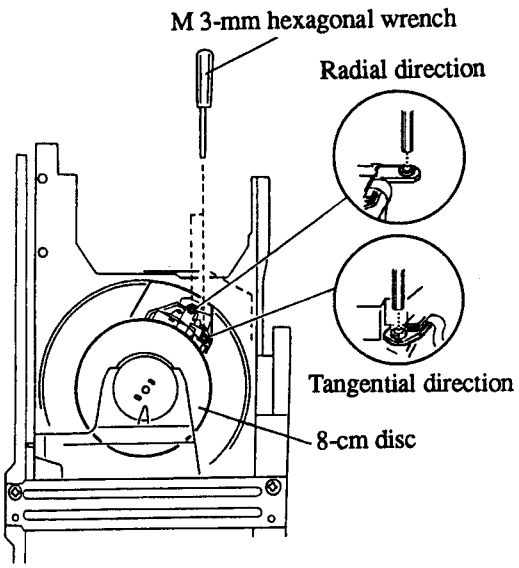


Figure 4

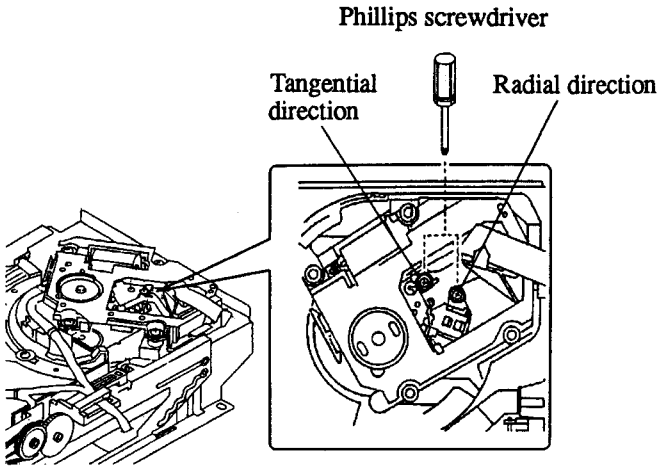


Single CD model adjustment locations

* : See Page 18.



Twin-tray CD type adjustment locations



Multi-play CD type adjustment locations

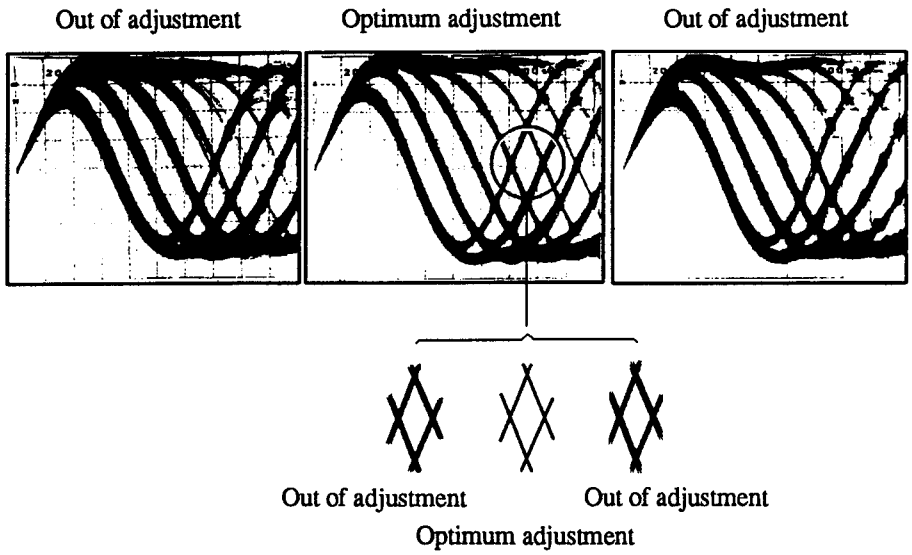


Figure 5 Eye pattern

5. RF level adjustment

• Objective • Symptom when out of adjustment	To optimize the playback RF signal amplitude No play or no search		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	• Player state • Adjustment location • Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL SEARCH FWD ⏩ or ⏪ key, then press the TRACK FWD ⏭ key, then the PLAY ▷ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ±0.1 V.

6. Focus servo loop gain adjustment

• Objective • Symptom when out of adjustment	To optimize the focus servo loop gain Playback does not start or focus actuator noisy		
• Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	• Player state • Adjustment location • Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL SEARCH FWD ⏩ or ⏪ key to move the pickup to halfway across the disc (R = 35 mm), then press the TRACK FWD ⏭ key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

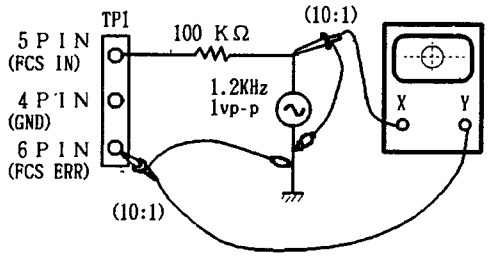
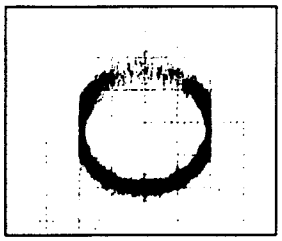


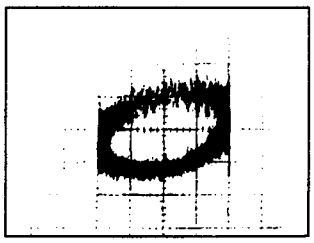
Figure 6

Focus Gain Adjustment

Large gain



Optimum gain



Minimum gain

7. Tracking servo loop gain adjustment

• Objective • Symptom when out of adjustment	To optimize the tracking servo loop gain Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
• Measurement instrument connections	See Figure 7. [Settings] CH1 CH2 50 mV/division 5 mV/division X-Y mode	• Player state • Adjustment location • Disc	Normal mode, play VR151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL SEARCH FWD ⏩ or ⏪ key to move the pickup to halfway across the disc (R = 35 mm), then press the TRACK FWD ⏭ key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

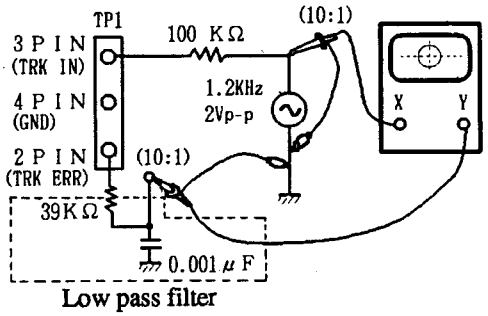
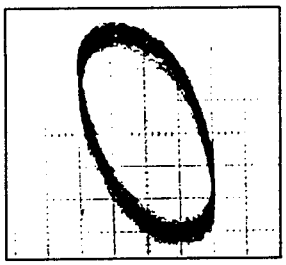
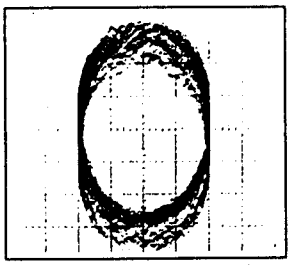


Figure 7

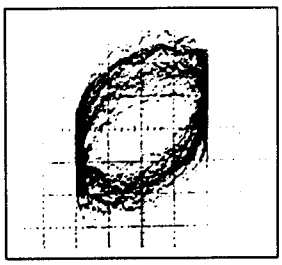
Tracking Gain Adjustment



Large gain



Optimum gain



Minimum gain

8. Focus error signal (focus S curve) verification

• Objective • Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
• Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FOCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	• Player state • Adjustment location • Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the TRACK FWD key and observe the wave form in Figure 8 for a moment.Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the wave form is only output for a moment when the TRACK FWD key is pressed, press this key over and over until you have checked the wave form.

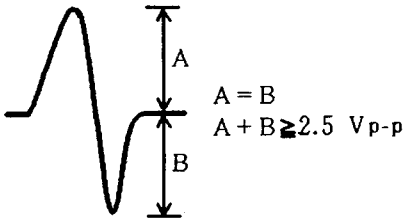


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

[How to remove Tray 1 for Twin-tray CD type]

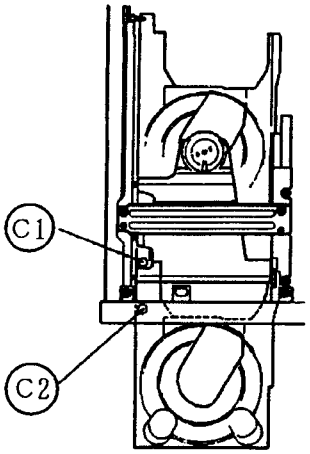


Figure 9

1. Put Tray 1 in the Open position.
2. Remove screws C1 and C2 holding Tray 1. (See Figure 9.)
3. Move Tray 1 in the direction of the arrow in Figure 10 and while removing the protruding section B of Tray 1, remove the A section where Tray 1 and the Slide angle U unit catch.
4. Lift up the Tray 1 Slide angle U unit side slightly and remove it.

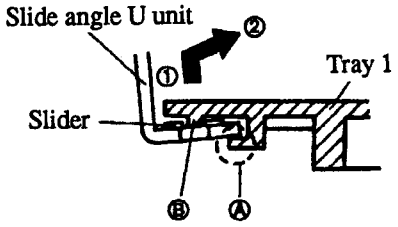


Figure 10

[How to install Tray 1 for Twin-tray CD player]

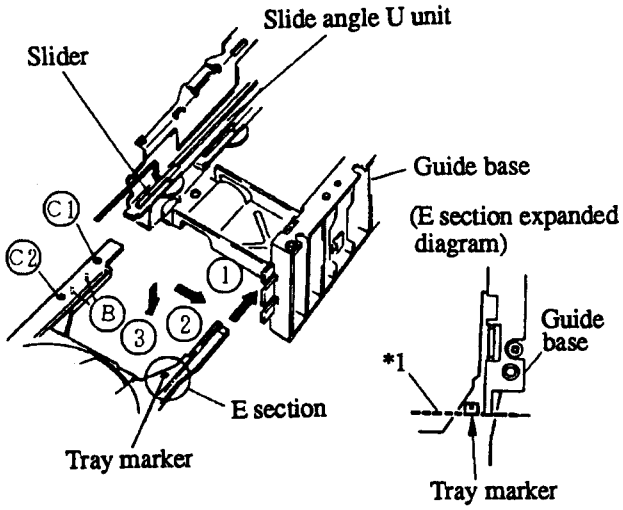


Figure 11

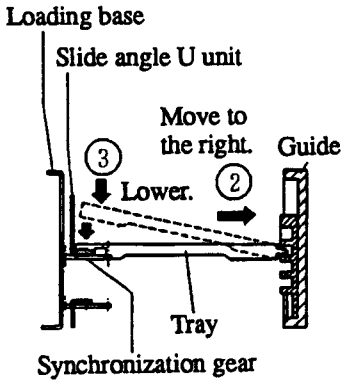


Figure 12

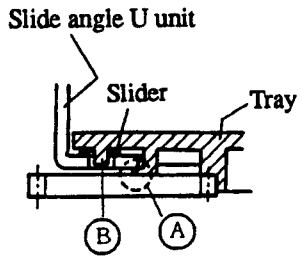


Figure 13

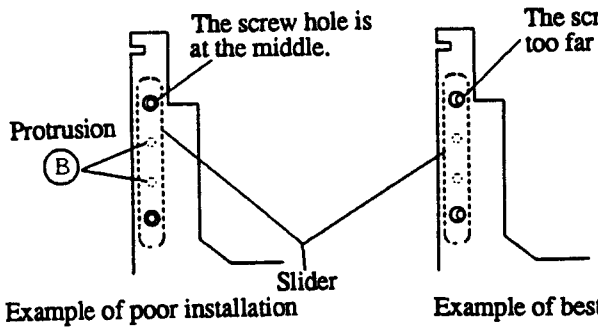

The screw hole is at the middle.
The screw hole is too far to the right.
Protrusion
B
Slider
Example of poor installation
Example of best installation
The protrusion section B of Tray 1 is not in the slider hole.

Figure 14

When installing Tray 1, first remove the front panel to make the work easier.

1. Put the slide angle U unit to the very front (the position when Tray 1 is completely open).
2. Put the slider in the very front as shown in Figure 11.
3. With Tray 1 at a slight angle as indicated by the dotted lines in Figure 12, insert Tray 1 until the slider and Tray 1 screw holes are lined up, being careful that the slider does not move to the rear.
4. While moving Tray 1 to the right (the guide side), lower it. Support the slider from below by hand.
5. Setting the catch section A of Tray 1 so that it catches on the Slide angle U unit as shown in Figure 13, insert the protruding section B of Tray 1 into the hole of the slider. At the same time, mesh the synchronization gear and the gear section of Tray 1.
6. After double checking that the screw hole of the slider is positioned at the center of the screw hole of Tray 1 as shown in Figure 14, fasten with Screws C1 and C2 in that order.
7. After installing Tray 1, double check that when Tray 1 is completely open, the position relations are as shown in the E section expanded diagram. If they are not, repeat the installation of Tray 1 from the start.

*1 : The tip of the guide base and the tray marker are lined up. When Tray 1 is installed poorly, they are about 2 mm apart